

Plan Title:	Economic and Agriculture Census and Surveys Support System
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PART I - INFORMATION TECHNOLOGY ARCHITECTURE PLAN

1. Information Requirements

Once every 5 years, the Census Bureau is mandated to conduct the Economic and Agriculture Censuses. This effort involves collecting and processing information from more than 15 million businesses (including non-employers and administrative records data) and over 2 million farms.

Subsequent to the preparation of this plan, the administration decided to transfer funding for the 1997 Census of Agriculture from the Bureau of the Census to the Department of Agriculture, effective with the budget for FY 1997. While direction for the 1997 Census of Agriculture may pass to the Department of Agriculture, it is assumed that the Bureau of the Census will, on a reimbursable basis, actually conduct much of the 1997 Census of Agriculture. Accordingly, we believe the IT plans relating to the Census of Agriculture described in this document will be adhered to with little change.

The Economic and Agriculture Censuses provide a complete detailed snapshot of the economic sectors they cover, from the national down to the local level. The sectors covered include:

- Agriculture
- Mining
- Construction
- Manufacturing
- Transportation, Communications and Public Utilities
- Wholesale Trade
- Retail Trade
- Finance, Insurance, and Real Estate
- Services

The economic censuses are the foundation for the Nation's economic statistics programs. They provide myriad information to private and public officials who use census data to make more informed economic plans and decisions.

The major uses for Economic and Agriculture census data are:

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- Provide a statistical framework for economic/agricultural surveys
- Measure and track changes in economic/agriculture activity
- Calculate composite and detailed measures of the Nation's economic activity
- Provide measures to plan and monitor public economic/agriculture programs; analyze related public policies
- Provide information to aid in private sector planning and management

Current Economic Statistics provide up-to-date, high quality economic statistics, and meet information requirements measuring performance in the manufacturing sector; the business community (service and distributive trade activity); characteristics of new housing and value of new construction; as well as Federal expenditure data on a geographic basis. In addition, statistics are provided on imports, exports, and the balance of trade between the United States and its international trading partners.

The objectives of Current Economic Statistics programs are to update, maintain, and improve the quality, accuracy, reliability and timeliness of the information collected; to provide annual, quarterly, monthly and periodic data at the geographic level that are responsive to Federal, state, and community needs; to ensure the continued focus of its programs on statistics important to national needs; to streamline and simplify the reporting process to the maximum extent possible (especially reducing respondent burden), and to conduct activities required for legislative and planning purposes.

PROGRAM GOALS

- Our census and survey programs and products are our core business; new technologies, research, special initiatives, and support activities must contribute to improved programs and should be evaluated in terms of their contribution. Our goal is that the Census Bureau's economic statistics programs be recognized as the most relevant, responsive, cost-competitive, and highest quality statistical program in the United States.
- Economic Programs proactively seek the support of our data providers and suppliers. Their support of economic statistics programs is critical to our success. Economic Programs will be responsive to our data suppliers' environment, record keeping practices, and their confidentiality concerns; we will aggressively pursue electronic data collection and identify ways to reduce reporting burden while also satisfying our program mandates. Data sharing, increased use of auxiliary and administrative information, and identification of innovative ways to provide information without imposing reporting burden are illustrative of initiatives that will be pursued.
- Economic Programs will provide information that is relevant, timely, accessible, and satisfies customer requirements. Economic Programs product line is dynamic, reflecting changes in economic structure, business operations, and customer demand. Annually, we

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will review the product line; products that are no longer relevant will be dropped. We actively seek innovative ways to add value to our products.

- Economic Programs microdata are a valuable resource; we will build on the accomplishments of the Center for Economic Studies work with the Longitudinal Research Database and extend this effort to nonmanufacturing sectors and seek innovative ways to make this information more accessible and useful to policymakers and other important users.
- Economic Programs will assess businesses, farmers, and key stake holders attitudes about confidentiality-related issues and recommend policy changes if appropriate. Currently, little information is available about our respondents' attitudes on confidentiality. New initiatives such as data sharing and efforts to make data more accessible and useful require a reexamination of confidentiality protection for willingness to give up some confidentiality protection for reduced reporting burden, whether the timeliness or type of information affects confidentiality concerns, and how changes in Census confidentiality policy may affect program participation.
- The Directorate will increase its competitiveness in terms of cost, responsiveness, quality, and timeliness in order to attract more reimbursable projects.
- The business register is the cornerstone of our economic statistics programs. Substantial improvements are required if the register is to capture rapid changes in economic structure, business organization, record-keeping practices, and satisfy the ever-growing demands of internal and external customers. Specifically:
 - the register should be the depository of the most current and comprehensive information available about businesses, stored in the register, linked, and easily accessible through the register.
 - the register must be flexible enough to satisfy all survey demands, both those of existing internal customers as well as new, external customers. Among the improvements required are new organizational linkages and improved classification information.
 - users must have access to the register in a manner that permits them to satisfy their requirements easily and in a timely manner; register processing operations that are bottlenecks or potential bottlenecks to census or survey processing must be reengineered.
- Economic Programs will reengineer our key business processes. Rather than seeking solutions for existing problems, the focus will be fundamentally rethinking our processes,

perhaps eliminating entire steps or combining steps when possible, or redesigning processes so they can satisfy multiple, common requirements.

2. Planned Processing and Telecommunications Architecture

INFORMATION TECHNOLOGY STRATEGY

A. Processing Philosophy

This Program Development Plan (PDP) focuses on enhancing the computer processing for the 1997 Economic and Agriculture Censuses and periodic surveys. For 1997, we will evaluate and, where practical, acquire equipment and software to support the further automation of the manual processing operations of the 1992 Economic and Agriculture Censuses. Technology will also be acquired and implemented in support of process reengineering efforts. In any case, each potential application of automation technology will be evaluated to determine its technical, economic, and operational feasibility before integration into production procedures. When appropriate, new technologies will be tested and prototyped on current survey processing before going into full production.

In particular, this PDP focuses on the formal evaluation of distributed processing techniques using minicomputers and client-server architecture to handle a wide variety of processing tasks. We will also investigate both mature and leading-edge technologies which have the potential for achieving substantial cost savings and productivity gains and which can easily be integrated into a distributed processing environment. We will ensure that the use of these technologies is aligned with and supports programmatic objectives.

We have identified a number of operations for potential or improved automation. Our aim is to avoid the use of nonstandard hardware and software and investigate commercially available solutions to minimize cost and reduce reliance on staff continuity and maintenance operations. Also, because many of the candidate operations take place over consecutive time periods within the census processing cycle, and because recurring survey applications are usually very similar to census applications, we plan to reutilize the equipment for these applications, thus minimizing training requirements and extending the time period for cost amortization of these systems.

In conducting the Economic and Agriculture Censuses and the related surveys, we strive to achieve certain fundamental goals. Primary of these are:

- Producing high quality data
- Producing timely data
- Conducting censuses and surveys in the most efficient manner
- Producing relevant and accessible (i.e. customer-driven) data products
- Being responsive to our data suppliers (e.g., minimizing response burden)
- Reducing clerical and paper processing

Census and survey processing consists of many complex operations, each of which is critical to the overall success of the census or survey. As technological advances are made, these operations become prime candidates for reengineering, streamlining and improvement through the implementation of innovative automation techniques and equipment. We will identify the major operational areas that offer the greatest opportunities for improvement without losing sight of our fundamental objectives.

B. Improvement of Operations

The improvement of the *questionnaire design, printing, and assembly* processes would have the effect of reducing the massive clerical effort of assembling questionnaires as well as minimizing respondent burden, thus contributing to an improved response rate. Traditionally, on a per unit basis, the cost of collecting and processing data from nonrespondents is substantially higher than from respondents.

The massive labor-intensive *labeling and mailing* operation for the census provides challenging opportunities for reducing clerical processing and thus realizing considerable cost savings.

With the numerous technologies commercially available for *data capture and collection* (see CASIC concept), there is great potential for improving this process. Technologies such as Computerized Self-Administered Questionnaires (CSAQ) and Electronic Data Interchange (EDI) can substantially decrease the volume of traditional keyboard data entry. Implementation of these technologies will result in increased accuracy and timeliness of data capture and an improved response rate (if establishments are able to respond quicker and easier). By reducing manual operations associated with paper questionnaire handling and data keying, substantial monetary savings can be achieved.

During the analysis phase of census/survey processing, subject matter analysts require timely *access to respondent data and forms*. During this time, there are literally hundreds of clerks and analysts scrutinizing data from tens of thousands of establishments and farms. Improved access capability will increase the productivity of our analysts while also improving data quality and the timeliness of our data products.

To meet the Census Bureau's vision of being "the supplier of choice for social and economic statistics important to the United States", we must be able to produce *relevant data products* for our customers. Widespread availability and accessibility of data is an important objective. Data in a form that can easily be analyzed and interpreted would facilitate planning and decision-making in both the public and private sectors. We will assess external user needs and exploit existing and emerging technologies, such as the Internet, to strengthen existing links among textual profiles, data tables and files, and other data and metadata available from public and private sources.

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Because conducting the census is so complex with numerous organizational units having both disparate and overlapping responsibilities, coordination of census operations is vital to its success. Automation can serve as a catalyst for improving *interdivisional coordination* and cooperation resulting in a more operationally cohesive census.

In the Economic area, the process of developing, implementing, and maintaining computer applications is a complex and challenging process. Programmers and subject matter analysts must work together to take advantage of new methods and tools. Automated tools must be provided to facilitate a *cooperative software development* environment. We must produce systems more quickly and correctly and with customer-driven functionality. Analysts will spend less time on learning and debugging software and more time analyzing data and interacting with external users.

PROCESSING AND TELECOMMUNICATIONS ARCHITECTURE

A. Architecture

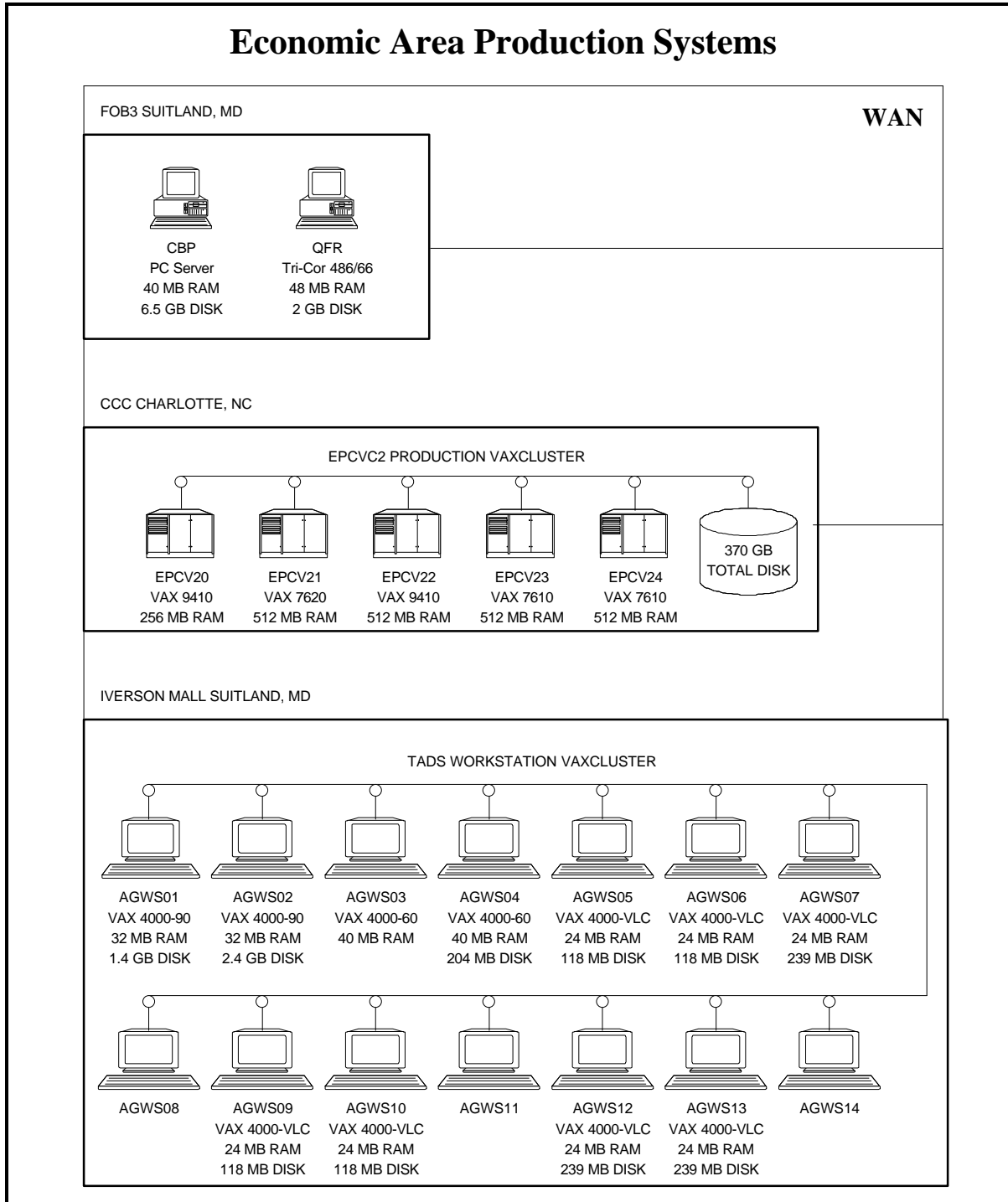
For the 1992 Economic and Agriculture Census processing we primarily used DEC minicomputers acquired under the technology refreshment option of the original DEC hardware minicomputer contract. This hardware configuration includes six large-scale minicomputers with upgraded memory and several smaller minicomputers that support the bulk of the census and survey data processing. In addition, this system supports numerous peripheral equipment such as printers, magnetic cartridge silos (for backup) and a large disk farm (over 440 gigabytes). We have also acquired various commercial software packages to help support the many production applications. These include a database package, database query software, screen design software and others. At peak, this configuration was able to support over 1000 concurrent users as well as background batch processing, nightly backup operations and hypercopy jobs.

In 1987 the census processing was done on several different computer platforms. This resulted in problems with data exchange, ability to adequately support several platforms, difficulty in sharing programming resources due to specialized training and so forth. In 1992 this situation was remedied by converting almost all applications for the DEC minicomputers. The major processing operations of data capture, data editing, interactive review, analysis and correction, tabulation (including disclosure suppression) and publication were performed on the DEC minicomputers.

The current configuration is consistent with our efforts to further automate our clerical processing operations using equipment that is modular in architecture, easily upgradable, redundant, easy to manage and easy to reconfigure, yet flexible and powerful enough to support a variety of different applications. Prior to 1997 Census processing, we will upgrade this configuration by adding more memory, CPUs and disk. We will also migrate from the DEC VAX architecture to the faster DEC ALPHA/AXP architecture.

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The diagram below depicts our proposed processing architecture through the completion of the 1997 Economic and Agriculture Census.



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- The proposed configuration can adequately support our processing plans and requirements for all Economic and Agriculture survey and census processing. Upgrading from the VAX to the ALPHA/AXP architecture will also bolster our computing capacity that is needed for anticipated census processing. ALPHA/AXP will also position us to migrate to open systems since it supports Unix.
- We anticipate that external and internal pressures to reduce cost and staff will continue. We do not have sufficient resources, funds and time to redesign our systems for other platforms before the 1997 census.
- We have invested substantially in training on the DEC systems. Both programmers and users have become comfortable with this system, expediting applications development and end-user analytical proficiency.
- The Census Bureau has invested considerable monetary and staff resources to support and maintain these systems. Since the current systems and much of the peripheral equipment have been paid for and are still stable, the cost recovery period should be extended through the 1997 census.
- The Digital Equipment Corporation (DEC) is actively involved in and rigorously supports industry and Government efforts to develop open systems architecture standards, such as POSIX and GOSIP. They also support many of the popular operating systems and software currently available in the marketplace (such as Windows NT, UNIX). This is consistent with the Census Bureau's plans for an open system environment as part of the mid-decade modernization program.

Even though DEC will be our primary processing platform for at least the next several years, we plan to continue the investigation of new technologies with the goal of reducing clerical processing and achieving substantial efficiency gains in all census and survey operations. These technologies, if possible, will be interoperable with the DEC systems to avoid problems associated with incompatible equipment. We will position ourselves to take advantage of a multiplatform environment that will include both the UNIX operating system and MS-Windows based systems.

We will also evaluate the applicability of client-server architecture for programs that can reap substantial benefits in terms of productivity, cost savings, data quality and customer service. For current surveys and reimbursable projects, we will migrate to UNIX and MS-Windows based systems. Before implementing any production system on client-server architecture, the following elements will be assessed as part of a benefit/cost analysis:

- staffing needs
- maturity and stability of hardware and software
- capability and stability of telecommunications infrastructure
- physical security

- electronic security
- internal and external support requirements
- hardware and software costs
- physical space requirements
- special environmental requirements
- interoperability with other systems
- disaster recovery capability

B. Alternatives Considered

Our backup computing strategy for the processing operations of the 1997 Economic and Agriculture Census and related surveys are the methods used for the 1992 census processing. The primary platform will be DEC minicomputers, although we will need to upgrade existing hardware (CPUs, disk storage, memory, video display terminals) to meet the expanded work load. This strategy represents our fall back position because it is effective and can be used with minimal modification.

We also plan to supplement this processing strategy by undertaking several initiatives to enhance our census and survey processing:

- We will increase our interactive processing capability for data and tabulation review and analysis, and for telephone operations. This will be done using the SAS tool set, X-terminal emulation software and other appropriate software.
- We will continue to convert Unisys-based census and survey applications to the DEC platform and other portable platforms.
- We plan to upgrade and modernize existing DEC hardware and peripheral equipment (e.g. printers) to support further automation of clerical operations and expanded capabilities of current processing applications. These plans will be in conformance with the Census Bureau's mid-decade modernization plan for an open systems environment.
- We will investigate alternative computer architectures (such as client-server computing) that will increase the efficiency and flexibility of census and survey processing. These will include UNIX workstations and MS-Windows based networked PCs.
- We will investigate commercially available software to minimize the need for in-house development and maintenance of special purpose software.
- We will consider using contract programmers when deemed appropriate for particular applications.

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- Working with other areas within the Bureau (ACSD, DADS), we will streamline and modernize our data products production system as we shift from printed to electronic data products. This will be done using various combinations of computer platforms, including DEC hardware, UNIX Workstations and MS-Windows based systems.

Our multi-platform computing environment together with the rapid pace of technological innovation and changing requirements makes technology decisions difficult and complex. At a minimum, such decisions will consider:

- The Bureau's and IT Directorate's policies, goals and plans
- Optimal utilization of IT resources, including staff
- System(s) characteristics such as size, scope, life expectancy, interoperability with other systems, level of support needed, technical requirements, backup and recovery, and so forth
- Cost of hardware, software, training, support and maintenance
- Availability of hardware and software
- Level of staff skills

In any case, our technology initiatives will be consistent with the mission and goals of the economic directorate and will support any future redesign or reengineering efforts.

C. Benefits

The benefits derived from implementing new or improved automation techniques are difficult to quantify at this point because we are in the initial planning and research phases for the 1997 census. However, we do expect substantial benefits from the implementation of each proposed technology, as described in PART II - Annual Plan. We anticipate that the investment in new technology for processing censuses and surveys will be offset by the cost savings and efficiencies realized by eliminating redundant/extraneous operations and by automating labor-intensive operations. The current trends of escalating labor costs and declining computer equipment costs increases the potential for realizing these gains.

The IT Vision for the Economic Directorate is to "provide a flexible computing environment to facilitate the reengineering and constant improvement of our business processes and products." A key enabler for achieving this vision is to provide "easy, powerful and efficient access to information to all users and customers." A flexible computing environment will provide opportunities for changing work processes and facilitating reengineering efforts. Building an architecture that will move us towards this vision will be our major IT challenge in the future.

The areas where we hope to achieve the biggest gains are:

- **Timeliness:** We believe we can make data products available at least several months sooner than the previous census.

- **Clerical effort:** Automation will allow for more efficient utilization of clerical staff, both at Headquarters and in Jeffersonville.
- **Customer relations:** Using technology to make responding easier and to deliver more relevant and easy-to-use data products will make our respondents and data users happier.
- **Costs:** The use of computer off-the-shelf software to develop generalized processing systems will reduce the staff currently needed to maintain many disparate survey processing systems.
- **Data quality:** Proven automated tools and techniques for capturing, editing, and analyzing data will result in better quality data.
- **Flexibility:** We will be able to react more quickly to changing customer requirements. We will also be in a better position to fulfill new requirements and increase reimbursable revenue.

Our plans for determining more precisely the benefits achieved by using a given technology will first include conducting a feasibility study of the technology and its application. Next we would develop a formal or informal benefit/cost analysis. If results are positive, we will select a representative survey to conduct a prototype using the proposed technology and attempt to extrapolate the actual benefits to the census. This type of approach will also minimize the risk associated with migrating to new systems.

3. Security

The ADP equipment will be located entirely within Census Bureau facilities at Headquarters (Suitland, Maryland); our primary forms processing facility in Jeffersonville, Indiana; and the Charlotte Computer Center in Charlotte, North Carolina. Most of the communications between devices on the systems will be confined to a single physical building or between two physically connected adjacent buildings. The physical security of the buildings will provide the basic security for the hardware. Access security for the system will be the same as that existing in our current forms processing operations. Communications between remote sites will be reviewed by the Telecommunications Office and is subject to normal security guidelines prescribed by the Telecommunications Office.

Because we plan to transmit data files in batch and real-time mode over telecommunications lines between Headquarters and remote sites in the same manner as our current operations, no new security requirements will be introduced. Therefore, current telecommunications should be satisfactory for our planned new initiatives. If we introduce remote image processing or electronics document management, we anticipate a large increase in prime time data traffic on current Headquarters local area networks (LAN) and between Headquarters, our Iverson Mall office, Washington Plaza, and Jeffersonville. We also plan limited amount of prime time interactive telecommunications between LANs located at Headquarters and LANs located in Jeffersonville and Charlotte to support management access and control information transmitted between networks. Current interactive telecommunication security arrangements should be adequate for our requirements.

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The DEC minicomputers at Headquarters currently serve as a backup site for our main DEC processing facility located at the Charlotte Computer Center. We rely on the IT Directorate to ensure compatible configurations between the two systems to facilitate contingency processing in case of disaster.

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PART II - ANNUAL PLAN ECONOMIC AND AGRICULTURE CENSUS AND SURVEYS SUPPORT SYSTEMS

1. Architecture Status

The architecture described in PART I - INFORMATION TECHNOLOGY ARCHITECTURE PLAN will be the primary data processing architecture to support the 1997 Economic and Agriculture Census and related special and periodic surveys. The processing for the 1997 censuses will continue beyond the year 2000. On an incremental basis, as resources become available, we will modernize existing systems and develop new applications on UNIX and MS-Windows based platforms.

2. IT Objectives

The Economic Statistical Methods and Programming Division (ESMPD) sets IT policy and guidelines to ensure appropriate and efficient utilization of IT resources. To achieve this goal, we are initially standardizing the software and hardware across the economic divisions. This will provide the foundation for expanding our processing capability and developing innovative IT approaches to support our business plans.

The Economic Directorate's primary IT objectives over the next five years include:

- Processing for the 1997 census on the DEC that requires minimal modification will remain on DEC through the 1997 census cycle.
- Work being moved from the Unisys that is tightly integrated with data or systems presently on the DEC will be migrated to DEC unless there is a compelling business case and resources to move the entire project to another software and/or hardware platform.
- Projects being redesigned that are independent of key products on the DEC will be considered for development using new technology. Candidate technologies will include UNIX workstations and MS-Windows based systems.

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- Beginning in FY 1998, computer processing support costs will be reduced by 10% annually.
- Application development and implementation will be accelerated by 20%.
- When building new systems, we will maximize adherence to the following technical principles and guidelines:
 - Portability of software
 - Interoperability of software and hardware
 - Interconnectivity with other applications/systems
 - Right sizing of hardware
 - Implementation of physically distributed systems (to minimize network traffic)
 - Use of commercially available off-the-shelf software
 - Adherence to industry and Bureau standards
 - Stability of hardware/software
- When building new systems, we will consider the following management criteria:
 - Priority of the project relative to other projects
 - Life expectancy of the application system
 - Financial viability of vendors/suppliers
 - Quality of support provided by vendors/suppliers
 - Central IT plans and policies
 - Cost to develop and maintain the system, including training
 - Staff availability and skill needs

3. Status of Operations and Processes

For each operation below, we will describe the technologies we plan to investigate to improve the operation; current progress made toward implementing each technology; and future plans for research and implementation. In many cases, our efforts will be in conjunction with other technical and research divisions of the Census Bureau.

A. Questionnaire Design¹, Review, Printing, and Assembly

Historically, these processes have been very complex, involving numerous tasks and many divisions within the Census Bureau as well as other agencies (OMB, GPO) and private printing contractors. The effort involved is even more difficult because there are over 500 versions of the economic census form that must be developed. The review and correction cycles required to

¹For information on the questionnaire design process see the "Publication Support System" PDP.

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develop the final questionnaires are lengthy, laborious, and expensive. Elimination or reduction of some of these tasks will result in considerable time and cost savings.

We currently use several methods of preparing mailing packages. Where practical, we rely on commercial printers to print forms and perform associated assembly operations. However, all addressing and complex assembly is performed internally. These operations are quite laborious, time consuming, and expensive.

Progress to Date:

We have acquired another electronic printing system to print and address questionnaires, letters, labels, instructions, etc. in the sequence necessary to minimize post printing assembly of complex mailings. We successfully implemented the system for the 1992 economic census by meeting its correspondence, remails, and follow-up requirements. We used this system to prepare the mailing packages for the 1993 and 1994 Annual Survey of Manufactures (ASM) and Company Organization Survey (COS). For the 1993 surveys, we mailed nearly 62,000 packages containing over 900,000 pages of custom printing. For the 1994 surveys, these figures increased to 105,000 packages and 1.2 million pages of printing. We plan to use this system for the 1995 ASM/COS and are in the process of converting our Current Industrial Reports to this system. In addition, we are researching use of this equipment for preparing the mailout for the multiestablishment portion of the 1997 census.

Current Plans:

Given the huge workload and limited resources of both Administrative and Customer Services Division (ACSD) and the economic subject divisions to complete the forms design for the 1997 census, we have purchased additional workstations and MECCA software for use by subject division staff. ACSD will train the staff in the use of the software. The trained subject divisions staff will assist by doing minor forms design forms design staff, if they can not complete all the work in the short time available. Four systems are up and running and two additional systems are being purchased.

We are developing a system to review forms and publications in an electronic format. This system will include the use of Adobe Acrobat software to transfer the forms or publications into Portable Document Format (PDF); then, using Acrobat Exchange and Remarks software to review and annotate the PDF files. This also serves to document the review process in electronic files. EPCD and ACSD are currently working on this system to expedite the forms and publication review process.

A consulting firm developed a conceptual design for modernizing survey mail processing in the Bureau. (See "CASIC" Concept.) The goal is to prepare an implementation plan for an automated, fully-integrated, print-on-demand Survey Mail Processing System. Due to funding constraints, this project is currently on hold.

B. Data Collection and Capture Methods

For the 1992 censuses and for many economic and agriculture surveys, questionnaire mailout and mail back, followed by keyboard data entry is still the primary method of collecting and capturing data. The Data Preparation Division (DPD) IT Program Development Plan (PDP) addresses traditional keyboard data entry. The CASIC IT PDP describes alternative methods and technologies for data collection and capture which will prove more efficient, accurate, and cost beneficial in the long run. We plan on working with the CASIC staff and other groups to test several promising technologies.

1. Digital Image Forms Capture

This technology involves the scanning, digitizing, and storage (on laser disk) of census and survey report form images for subsequent on-line retrieval. As laser disk standards evolve, this technology has the potential for replacing microfilm as an archival storage method. Presently, the shelf life of optical disk is estimated to exceed 50 years. Another use would be to reduce manual form handling by enabling data transcribers to key data from form images rather than from hard copy questionnaires. Other paper movement currently required during processing would also be eliminated. Digital imaging also serves as the underlying technology for optical character recognition.

Current Plans:

Approximately 70,000 Characteristics of Business Owners Survey (CBO) forms will be imaged and stored on CD-ROMs. These images will be indexed and available for review by analysts using a PC to retrieve the images.

2. Optical Mark Recognition (OMR) and Intelligent Character Recognition (ICR)

As more powerful computers and sophisticated algorithms are developed, ICR becomes a technologically viable and economically practical alternative to traditional methods of data capture. Using these technologies to replace much of the data keying operation will significantly reduce paper handling and the labor-intensive, costly keying operation.

Progress to Date:

The Census Bureau designed and built two new 56-pocket (which enables single pass sorts) and six 5-pocket laser barcode reading mail sorters. We barcoded Census ID numbers and selected classification codes for automated forms handling operations for the 1987 and the 1992 Economic and Agriculture Censuses (mailout package content verification for multiunits; check-in of incoming mail receipts; sorting forms by trade area, size class, geographic area; and so forth). These sorters were fast, very accurate and required minimal maintenance.

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FOSDIC was used successfully for data capture of almost one million forms in the Survey of Minority-Owned Business Enterprises (SMOBE) and Women-Owned Businesses (WOB). New software was developed for these surveys that allowed a respondent-friendly form design to be read by FOSDIC. We realized considerable savings compared to the cost of 100 percent key entry.

In conjunction with the Statistical Research Division (SRD), we are testing the automated capture of data (using ICR) from FAX images of forms for the M3 Survey. This project is called the Paperless Facsimile Image Reporting System (PFIRS). We are currently testing 100 M3 cases on the PFIRS systems. The average percent of characters read correctly is 84 percent. Even though we would prefer the rate to be higher, we are comparing the review of failed cases on the PFIRS systems to the keying of the entire form. We are using Teleforms software which has some limitations that are unacceptable; therefore, SRD is investigating other software packages. Of the 3500 monthly cases, we expect to receive about 1000 FAX responses. If this project is successful, the M3 data keying work load would effectively be nil.

In 1994, the Census Bureau cosponsored with the National Institute of Standards and Technology (NIST) a technical symposium to test the viability of character recognition. The test results indicate that numeric character recognition is viable and can be successfully used to replace some keyboard entry. We are waiting on results from the 1995 Census Test before making a decision for Economic forms.

Current Plans:

Technical Services Division (TSD) is developing an imaging system that will process approximately 70,000 forms for the CBO. This system will go into production later in 1996. OMR will be used to capture check box responses. Write-in data will be keyed from images. Form images will be stored on CD-ROM, and analysts will have access to these for review. Once the form has been imaged, the data capture and review processes will be entirely paperless.

We will continue to use and expand our use of barcode and automated sorting technology for the 1997 census.

The decennial census is researching use of imaging and character recognition for the 2000 census. We will evaluate these results to determine this technology's viability for economic census and surveys, with a target for the 2002 Economic Census.

3. Electronic Data Interchange (EDI) and Internet

With the establishment of industry-endorsed standard data formats, many companies are converting to EDI as a means of exchanging data with their suppliers and customers. If companies are already using EDI, they are more likely to be cooperative in responding to our

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census and survey questionnaires. With EDI we hope to reduce response burden and to improve the response rate, especially for large companies; and also to reduce our paper processing.

Progress to Date:

We introduced EDI reporting in the 1992 Census of Retail Trade from a number of large establishments. Our experience indicated a lack of interest by businesses in investing resources for one time use in a census. EDI programming resources are scarce, and businesses use it mainly to exchange data with their suppliers and customers, which adds to the "bottom line" profit.

In the 1993 COS, data for 2,550 establishments were transmitted in the EDI format by five large companies. The 1994 COS had nine companies with over 7,000 establishments covered. The 1995 COS will cover 10 companies with approximately 8,000 total establishments.

Current Plans:

We will continue to expand the use of EDI in the current program area, particularly the Monthly Retail Trade Survey. We expect to receive a test file in early 1996 from one company, and we will target 50 companies for electronic reporting over the next three years. We expect that electronic filing will reduce the reporting burden for the respondent as well as reduce our paper handling, data keying, and other resource intensive operations.

We are planning to expand the use of EDI reporting to our monthly economic programs. One large oil company has already agreed to report for all (approximately 600) of their gasoline stations using EDI this year.

We will investigate data collection through the Internet. Issues that we will consider are security, availability of Internet access to our respondents, and technical requirements.

4. Computer-Assisted Telephone Interviewing (CATI) and Computer-Assisted Personal Interviewing (CAPI). (Also see "CASIC" Concept).

Progress to Date:

In 1995, CATI was used as a follow-up mechanism for the semiannual Investment Plans Survey (IPS). Approximately 4,500 completed cases were conducted. Cost savings resulted because less remails were needed. Plans for 1997 are to utilize CATI in a similar fashion.

5. Computer Self-Administered Questionnaire (CSAQ)

The proliferation of personal computers in private industry together with the increasing sophistication of users has made CSAQ a viable alternative for data collection. CSAQ provides a self-explanatory (with appropriate on-line instructions), easy-to-use instrument for

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establishments in responding to the numerous and sometimes complicated questions on censuses and surveys. This technology has the potential for improving response rate, capturing more accurate data reducing clerical paper handling, and reducing analyst editing of the data.

Progress to Date:

The 1993 COS CSAQ prototype was sent to 112 entities representing approximately 22,000 establishments. The mailout was a parallel one; that is, we sent both the diskette and the paper form to each of these entities. Eighty-eight of these entities, with over 17,000 establishments, completed the CSAQ. The other 24 reported on the paper questionnaire. We feel that this 80 to 20 percent proportion sends a definite affirmative message from companies regarding CSAQ reporting.

The 1994 and 1995 COS CSAQ was sent to approximately 200 entities covering over 30,000 establishments. In addition, an electronic reporting inquiry was sent to over 20,000 companies in the 1995 COS.

The 1994 ASM CSAQ was developed and was tested with eighteen companies. Fourteen completed the CSAQ. The response and remarks from these companies were very positive. Testing of CSAQ is continuing in the 1995 ASM.

A CSAQ instrument was created for the Industrial Research and Development (R&D) Survey. It was authored using the Energy Information's (EIA) PEDRO communications software shell. The instrument itself was written by TMO staff using the "CASES" software used in the Bureau's CATI and CAPI programs. To date almost all of the 100 CSAQs mailed have been completed and returned.

Current Plans:

In the 1996 survey year, a new version of the R&D CSAQ will be developed. One is also planned for the 1996 Commodity Flow Survey (CFS). We plan to utilize CSAQ for the Retail Sector of the 1997 Economic Census.

6. Touchtone Data Entry (TDE) and Facsimile Reporting

For surveys that are amenable to TDE response (i.e., short; survey questions are precise requiring numeric, succinct responses), this technology can substantially reduce paper handling. By eliminating the intermediate task of transferring data from questionnaires to computer-usable form, TDE could substantially reduce clerical operations associated with data keying. By making it easier to respond to questionnaires over the telephone, respondent burden is also reduced. TDE can also be used in combination with facsimile reporting. Respondents can request forms via TDE, which can then be transmitted via FAX to the respondent, and the completed questionnaire FAXed back.

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Progress to Date:

We have implemented a production TDE System for capturing data from approximately 1,200 reporting units (out of 4,900) per month for the Manufacturers' Shipments, Inventories and Orders (M3) Survey. Cost and staff savings have accrued as a result of reduced data keying work load and fewer forms being mailed.

The use of TDE in the M3 continues to be very effective, saving both analyst and respondent time, eliminating data keying for over 1,200 monthly report forms, and reducing postal fees by mailing 877 Advance notice cards instead of report forms. We are presently calling respondents not using TDE to encourage them to try it.

We use TDE as part of a fax-back system for respondents in the Industrial Research & Development Survey. Respondents call a toll-free number to request copies of forms and instructions, which are faxed to them within 24 hours. We are expediting the remail operation as a direct benefit. We will continue to evaluate the effectiveness of this technology for other economic and agriculture surveys.

Through the Statistical Research Division, PFIRS in conjunction with TDE are being used for the Investment Plans Survey (IPS) to send reminder notices to companies whose survey forms are coming due. Approximately 9,000 facsimiles are sent over a two week period. Through the TDE/PFIRS system, about 23,000 companies have the option to request that a new survey form be faxed to them.

Current Plans:

We plan to use TDE as an alternative data collection technique for the semiannual Investment Plan Survey (IPS) in early 1996. As many as 20,000 companies over a 2 1/2 month period for each cycle would have the option to use the TDE System. This would result in less initial mailing and remails and would expedite response to the survey.

The Quarterly Financial Report (QFR) program plans call for the development of a TDE system within the next two years. The system will be used to capture data for six items on the questionnaire from the very largest size companies. Presently, these data are collected by telephone and then manually keyed into the QFR computer system.

7. Telephone

To provide more responsive customer service, establishing a toll-free telephone service linked with an on-line census information system is critical to the success of the census. If respondents' questions and requests are addressed promptly, our response rate would increase and we would receive more accurate data.

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Progress to Date:

We implemented an interactive system for almost all the 1992 Economic and Agriculture Census forms. We fielded almost 242,000 calls requesting general information, data clarification, time extensions, and so forth.

Current Plans:

We expect to expand and refine the 1992 Economic Census Telephone System for use during the 1997 Economic Censuses.

- We will investigate using an automated call distribution system to better manage incoming and outgoing calls.
- We plan to improve the functionality and make the current system more user-friendly.
- We plan to add a note pad feature to allow users to document any relevant issues identified during telephone conversations when referring calls to an analyst.
- We plan to incorporate the "Analyst Call Back" feature into the telephone system. Due to a lack of resources in 1992, a separate basic utility program with limited access was created to handle the analyst call backs.

We are including an 800 number on the 1995 ASM questionnaire and on CIR questionnaires beginning with those mailed in 1996.

In addition to the above technologies, we will work with the CASIC staff, SRD and the Central IT Area to investigate other innovative technologies that would help us achieve our economic area goals. Among these technologies are voice recognition, CATI², FAX reporting, automated microfilm access (automated libraries, microfilm access devices, etc.), wireless communication devices and others.

C. Labeling and Mailing Operations

1. Printers

For the 1992 census we printed several million address labels with identification barcodes and attached them to preprinted forms in separate operations. These labels were produced using impact printer technology which tends to require frequent service, is slow, and generates lower quality barcodes. Economies can be achieved by performing these operations in one pass using ink-jet or laser technology. Also, better barcodes would reduce the reject rate during the automated check-in and sort operation, obviating the need for manual keying of barcodes.

² We used CATI for nonresponse follow-up for the 1992 Census of Agriculture (approximately 150,000 cases) and the Survey of Manufacturing Technologies (approximately 2,000 cases). We are also using CATI for the M3 and Quarterly Apparel surveys.

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Progress to Date:

We used the Xerox 4090 printer to print questionnaires including previous year information and address information for the 1993, 1994, and 1995 Company Organization Survey (COS) and the Annual Survey of Manufactures (ASM). This gives us greater control over the printing and mailing process.

Current Plans:

M3 is investigating using 4090 printers for generating 'PFIRS-type forms', if the decision is to go full scale with PFIRS.

We plan to acquire sufficient ink-jet-jeent time, eliminating data keying for over 1,200 monthly report forms, and reducing postal fees by mailing 877 Advance notice cards instead of report forms. We are presently calling respondents not using TDE to encourage them to try it.

We use Laser Sorters

For the 1992 censuses we used the automated laser sorters for the form check-in and sort operation. Timely check-in of questionnaires results in more accurate follow-up operations. If forms miss being checked in, establishments can mistakenly be requested to return their form again, potentially causing strained customer relations. Sorting the forms (by trade area, size, etc.) allows for their distribution to appropriate clerical units for further processing.

Progress to Date:

For the 1992 census the sorters were extremely reliable with an overall barcode reject error rate of approximately 1.0 percent. The rate would have been substantially lower were it not for faulty envelopes produced by the contract printer. By comparison, the 1990 decennial census had a reject rate of about 2.0%. The "failed scan" (barcode not read) rate for the Agriculture/Economic Census was 0.15 percent.

Other surveys use this equipment for sorting and checkin. For example, the Annual Capital Expenditures Survey (ACES) mails 30,000 cases and the Investment Plans Survey (IPS) mails 60,000 cases annually.

Current Plans:

We will upgrade these sorters as this technology advances. We are confident that we can achieve even a lower barcode reject rate. We expect to keep these systems operational and in use for current surveys and the 1997 Economic and Agriculture Censuses.

3. Geographic Coding and Sorting for Post Office

The U. S. Post Office offers reduced postage rates for bulk mailings if the envelopes have a post-net code and are sorted by 9-digit ZIP Codes. By mailing packages in this manner we saved over \$500,000 in postage charges for the 1992 censuses. In addition, we saved considerable resources in the DPD preparation of the packages for mailing.

Progress to Date:

We acquired and used the "Group One" software package to generate post-net codes and 9-digit ZIP Codes based on the mailing address. We coded and sorted over 12.5 million addresses for the 1992 Economic and Agriculture Census using this software.

We use "Group One" software for noncensus surveys such as the Annual Capital Expenditures Survey (ACES) and the Investment Plans Survey (IPS).

Current Plans:

We will continue to use USPS certified software such as "Group One" to qualify and maximize our postal mailings of our large surveys. In addition, this will improve the deliverability of the mailing pieces with the delivery point (11-digit ZIP Code) post-net bar code.

D. Analyst Access to Data and Forms

1. Digital Image Forms Capture³

During the analytical phase of a census or survey, data analysts frequently need to look at the original form to check for additional information (i.e. notes or explanations on the form) that would help in the resolution of data inconsistencies. Historically, analysts have either used microfilm for this purpose or have resorted to the labor-intensive, time-consuming and costly procedure of having the original forms pulled in Jeffersonville and mailed or faxed to headquarters. These types of manual operations also disrupt the flow and continuity of the analysts' work, reducing efficiency. If the forms could be recalled on-line together with the data, the entire analysis process would be completed several months sooner resulting in earlier release dates.

Progress to Date:

In 1988 we acquired a small scale prototype optical disk-based imaging system and installed an interface to the DEC minicomputers. In June 1989, we augmented this system with additional workstations, magnetic disk, optical disk and an optical disk jukebox. We used this system to

3 See also Section B. Data Collection and Capture Methods.

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conduct a pilot study on a medium scale survey (the Manufactures Energy Consumption Survey). Initial results showed marked data access improvements by analysts during the edit referral and analytical review phases of the processing. Timing and budget constraints interrupted our research.

We imaged approximately 70,000 CBO forms onto CD-ROMs. The images will be indexed and available for review by analysts using a PC to retrieve the images.

Current Plans:

In the past few years, image technology has rapidly progressed and matured to the point of being a viable business-critical technology. The emergence of several imaging standards along with such features as better data compression, high-capacity communications networks, automated indexing, high-density laser disks and others have made imaging a practical option for large-scale forms processing operations. We will investigate the capability of this technology to capture several hundred thousand multipage forms in a short period of time. Since cost will be a significant factor, we will measure potential benefits against acquisition, integration (with DEC), installation and maintenance costs for this equipment.

We acquired document management and work flow software to use in tracking and routing office documents. This will increase the productivity of survey statisticians because they will be able to view and make changes to documents online and then automatically route these documents to appropriate staff.

2. Integrated Database

The SSEL contains basic information about all establishments in the U.S. and serves as the universe for major census activities such as mailout, check-in, completeness, SIC coding and intercensal transfers. The SSEL also serves as the frame for selecting samples for many economic surveys. A more desirable type of data repository would be a centralized, integrated database containing all SSEL data and census-collected data from all sectors of the economy. The goal is to achieve a consistent and current view of all economic data and to allow universal seamless access to the data from a variety of computer platforms. The database must be flexible enough to satisfy all survey demands, both those of existing internal customers and new external customers. Among the improvements will be new organizational linkages and improved classification information.

Progress to Date:

The SSEL has been converted to DEC. All trade areas have developed central databases as the foundation for all their processing operations. Links have been developed between the SSEL and the trade areas' databases to facilitate such operations as intercensal transfers, updates to the SSEL and creation of external and internal data products. Also, 18 million non-employer

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establishments have been added to the SSEL, greatly expanding coverage for this sector of the Economy. We created an SSEL data warehouse including ad-hoc query capability via the SAS toolset.

Current Plans:

A Register Improvements Team continues to develop plans for the business register. They have recommended, and we continue to implement a two-phase approach for strengthening and modernizing the register.

In the first phase, we are making several incremental improvements designed to address near-term needs of the 1997 Economic Censuses and the periodic surveys. These include: (1) expanding register content to include annual receipts measures and geographic codes for Congressional Districts, Census Tracts, and Census Blocks; (2) improving procedures for using industrial classifications from administrative records; (3) implementing an expanded program of quality assurance measures; and (4) doing research on enterprise definitions and methods for representing the organizational structures of complex firms.

The second phase will completely redesign the register. Goals for this undertaking include: (1) enhancing data integration throughout the economic programs; (2) making an operational separation between register functions and control file functions in order to resolve the conflicting demands that they impose; (3) establishing register entities for subsidiary/divisional units of complex multiestablishment enterprises; (4) supporting generalized systems for data collection and post-collection processing; (5) recording and monitoring each company's reporting burden and response history; and (6) making other high-priority improvements recommended by the team.

We will redesign the entire SSEL database to build tighter electronic links between all the trade areas' databases and the SSEL. The goal is to eliminate redundant data and operations, and provide a consistent view of all census data. Initially, we will provide hardware and software tools to access, manipulate and analyze census data for internal users.

We will logically separate the control file portion of the SSEL from the register part. This will result in more efficient processing of all trade area data.

After the 1997 census, we will redesign the SSEL processing system to conform with open systems standards. This will also depend on the Bureau's supported database packages and Oracle Corporation's commitment to continued Rdb support.

3. Client-Server Technology

We expect that for the 1997 census, all applications will migrate from the UNISYS mainframe to other platforms. An alternative to centralized processing is client-server technology. Client-

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server technology allows for the efficient distribution of resources and applications while providing high system availability to a large number of users. One component of client-server architecture is the workstation. Workstations could be used to support applications such as tabulation review and statistical data analysis. In the last several years workstation systems have become relatively inexpensive and there are many on the market that are more powerful than large DEC minicomputers.

Progress to Date:

For the 1992 Agriculture Census, we developed a system to define, test, review and correct publication tables on DEC workstations (TADS). All told, analysts reviewed over 30,000 pages of tables. We used this system for the 1992 Census of Outlying Areas.

We acquired three SUN workstations and a server to analyze 1992 Agriculture Census data. With a relational database package and statistical analysis software we were able to conduct research, perform evaluations and produce special tabulations for our customers in a more timely manner on a reimbursable basis. We will also allow external customers (e.g., USDA) to do research on our system.

We acquired a SUN workstation for use in review and analysis of the 1992 SMOBE. This workstation has allowed us to perform research, graphical data analysis, imputation, data cleaning and preliminary tabulations for this survey more efficiently. We plan to expand the use of this equipment to produce special tabulations and to analyze the SMOBE/WOB data and the 1992 Economic Census Summary data.

We acquired a Hewlett-Packard workstation which is currently being used for statistical data analysis for the 1992 Census of Manufactures and the Manufactures Energy Consumption Survey (MECS). We will expand the use of workstations for data research and special tabulations.

We acquired and installed three workstations to begin the development of StEPS. We will use these workstations for four prototype surveys. Plans are being finalized to acquire additional production workstations.

Current Plans:

The Tabulation and Disclosure Review System (TADS) will be used for the 1997 Agriculture Census (U.S. and Outlying Areas) with little modification. We do not plan to start new projects using TADS because it relies on a proprietary software product, DECdecision, which is no longer supported by DEC (it is supported by a third party vendor).

We have prepared the procurement documents to acquire three workstations and one server to support SAS processing by the analysts. These workstations will run the UNIX operating system and employ the most advanced microprocessor available - the 64 bit Alpha processor from Digital

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Equipment Corporation. They will have such advanced peripherals as high capacity, rewritable optical drives. This configuration of a server with distributed workstations will provide these benefits:

- Provide analysts access to high performance computing resources at a cost less than that for VAX-based clusters.
- Ensure that data analysis does not interfere with production processing and vice versa by presenting competition for access to production databases and computer resources.
- Through a POSIX-compliant operating system, provide adherence to FIPS standards.
- Provide access to high capacity storage at very low cost (less than \$100 per GB).
- Insulate workstation users from the impact of network failures.

We researched appropriate client-server tools to increase programmer and analysts' productivity. For a pilot, we will rewrite (from the Unisys) the Monthly Building Permits processing system using DECAmire, Visual Basic, a relational database and a Windows NT Server. ERwin (an entity relationship software package) and BPwin (a business process re-engineering package) may also be used. A primary goal is to develop a system which is portable to different platforms.

Agriculture and Financial Statistics Division Computer Laboratory: This facility has microdata files available for the 1982, 1987 and 1992 Censuses of Agriculture. In addition, the following microdata files are also available for use: 1987 Census of Horticulture, 1988 Agricultural Economics and Land Ownership Survey (AELOS), 1984 Farm and Ranch Irrigation Survey (FRIS), 1988 FRIS and 1994 FRIS. The lab is used by both division researchers and outside (sworn Agents) researchers in conducting research to validate previously published data or to support current projects. The availability of microdata in-house has allowed AGFS to respond to requests for special tabs in a cheaper and more expeditious manner.

Enabling subject matter divisions to access dedicated workstations connected to the Census Bureau-wide network has increased the overall processing efficiency of censuses and surveys. Also, analysts have been able to perform more rigorous and thorough analysis of data, leading to improvements in survey design, data quality, timeliness and so forth. The advantages of using a local workstation system include:

- Reduced competition for computer resources of mainframes and minicomputers
- Workstations have the computing power rivaling that of a mainframe and at lower cost
- Analysts become more computer-literate which increases overall processing efficiency in the long run
- The subject matter division maintains control of computer resources
- Analysts have freedom to configure the system and purchase software tailored to their own requirements
- Local workstations reduce network traffic allowing for more efficient processing

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We will continue to evaluate client-server, minicomputers and other technologies for their applicability, efficiency and cost-effectiveness for processing economic programs. We will acquire PCs and workstations for programmers and analysts on an incremental basis, consistent with the implementation of LAN-based applications. We will also address associated issues such as systems management (e.g. tuning, backup), software configuration management, peripheral equipment needs (such as laser disk drives), software development tools and telecommunications requirements resulting from the use of this technology.

4. Automated Coding

Currently, many of the uncoded establishments in the economic census are coded using a computer-assisted classification system. Analysts look at various data items (such as respondent's self-description, company name, products, etc.) and then select various menu options to determine the correct Standard Industrial Classification (SIC) code or Kind-of-Business (KOB) code. For the Census of Manufactures analysts go through a similar process to code products and materials. For cases that remain unclassified, phone calls are made or letters are sent to respondents requesting more information. Obviously, this coding process is slow and laborious and many cases remain unclassified. An automated system that would code cases based on current, historical and other sources of data would significantly speed up this process.

Progress to Date:

Automated Coding of Business Descriptions: For the 1987 and 1992 Economic Censuses, IRS provided us with a 20 character description of activity for all sole proprietorship returns without a respondent-assigned industry code. The Census Bureau developed a completely automated computer program that searches the written description field and assigns appropriate industry codes. For 1992, we assigned classification codes to approximately 64 percent of the 3 million uncoded sole proprietorship returns. The Census Bureau would like to expand this automated procedure for the 1997 Economic Censuses.

Computer-Assisted Coding System: Cases not coded through the automated coding system are coded by our clerical staff using an interactive computer-assisted coding procedure. The coding clerk enters the industry division (e.g., Agriculture Services, Retail Trade, etc.) and also enters a descriptive word from the business activity. The computer then lists all the possible choices and the clerk selects the most appropriate industry. We plan to use the existing system for the 1997 Economic Censuses.

For the 1992 SMOBE, we used an automated coding system for race and ethnicity write-ins (adapted from the 1990 Decennial Census System). This system coded 88 percent of write-ins, a substantial improvement in accuracy and efficiency over earlier surveys.

Current Plans:

Automated Coding of Business Names: Using a version of the automated program detailed in (a) above, the Census Bureau assigns Standard Industrial Classification (SIC) codes to unclassified records based on the business name or trade name. This annual SSEL operation typically assigns SIC codes to approximately 22 percent of the unclassified records. We plan to migrate this program to DEC (currently runs on the UNISYS) and expand its capabilities.

Automated Industry Coding for NAICS: The Automated Industry Coding Task Group (AICTG), which includes representatives from the Census Bureau, IRS, and other Federal agencies, is developing an automated coding system that will assign classifications codes based on the NAICS structure. The AICTG initially plans to code the 1998 sole proprietorship tax returns using this automated system. These codes are vital to Census Bureau operations.

5. Statistical and Graphical Analysis Software

Powerful statistical analysis tools are now widely available. Use of this software will significantly reduce many of the custom coded applications being developed for analysis and publication purposes. Also, using graphical analysis software, much of the data which is currently presented in a tabular format could be translated into easier to analyze graphs. Data presented in this fashion are clearer and more meaningful. Also, processing anomalies could be identified via visual inspection. Using these tools would reduce the programming effort as well as provide analysts with more ergonomic computer interfaces.

Progress to Date:

We have acquired an expanded license for SAS software which contains modules for extensive statistical data analysis and tools for creating graphs. SAS runs on many widely available computer platforms (UNIX platforms, PCs, DEC) and is constantly improving its statistical analysis and data manipulation tools.

Current Plans:

A recent initiative using SAS products responds to user requests for improved access to the economic programs' business register, the Standard Statistical Establishment List (SSEL). In the past, we have limited wide-ranging searches of this transactional database because we were concerned that increased query volume and index overheads would degrade performance for critical maintenance operations. Now we are developing a data warehousing approach that makes a snapshot of the SSEL available for SAS-based queries, tabulations, graphing, and statistical analysis. We have released the new query tool to a small group of users who are assisting us with functionality and performance tests. Their initial reaction is very favorable. During the next few months, we expect to complete testing and to release the query tool for use by the general population of SSEL users.

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We are using SAS to expand and modernize quality assurance procedures applied to administrative data obtained from the Internal Revenue Service, the Bureau of Labor Statistics, and the Social Security Administration. These administrative data are a principal information source for the SSEL, so it is important to monitor the data closely, to maintain their quality, and to give effective feedback to supplying agencies.

We are developing a prototype using SAS to provide increased analytical access to Manufacturing and Energy Consumption Survey (MECS) data.

We will continue to explore all the capabilities of SAS as a tool for data analysis and graphical presentation as well as general-purpose programming projects. We will also investigate the use of cartographic data representation for geographic-based data. We plan to install SAS on our DEC minicomputers and UNIX workstations for greater accessibility for analysts and programmers.

E. Data Products

The Economic and Agriculture Census and related surveys yield a wealth of information used by both the Government and private sector in helping to shape policy strategy and decisions. All the statistics released are in the public domain, assuring that the benefits of the data are as wide as possible. For the 1987 census, data products were made available in the form of printed reports, computer tapes and CD-ROM. Over the past several years, some economic survey results have also been distributed on floppy diskettes. For the 1992 censuses, almost all of our data products are available on CD-ROM. In addition, some survey results are published using desktop publishing software. This method reduces the time needed to publish data by eliminating many of the steps involved in creating printed reports. We will continue to improve economic products so that they consistently meet or exceed customer expectations in terms of timeliness, relevance, and accessibility.

With CD-ROMs, on-line services, multimedia and the Internet becoming a larger part of the public's information tool kit, data users are seeking an increasing amount of information in electronic form. However, it is no longer enough to simply make the data available electronically. Today's data user requires a system that produces timely data, is easy to use, is pleasant to view, and that is flexible enough to fulfill their data needs. To address these needs, working with the DADS group and ACSD, we will substantially reduce our paper publications and release the majority of the 1997 Economic and Agriculture Census data via improved electronic data delivery techniques on the Internet and on CD-ROMs.

For the 1997 Census, we are streamlining our production system to ensure that data are released to the public as soon as they are approved by subject matter analysts. This will involve the integration of new hardware (for an Economic Directorate Server for use by analysts to verify summary data) and new software (such as Adobe Exchange and Re: marks) for reviewing, correcting, and annotating electronic PDF table images.

1. CD-ROM

As microcomputers and CD-ROM drives have become widely available and less expensive, CD-ROM has gained popularity as the distribution medium of choice for economic and agriculture statistics. The CD-ROMs that we make available also contain the software needed for the customer to help search for, extract and print, manipulate and analyze targeted data. It is becoming easier and cheaper to produce CD-ROMs. The CD-ROM satisfies our customers' demands for more useful and flexible data products while at the same time being inexpensive to mass produce.

Progress to Date:

For the 1992 census we eliminated magnetic tape as a product medium. All information contained in our printed reports was available on CD-ROM. We also eliminated most of the paper documentation by including it on the CD-ROM media itself. Further, we provided five tools on the CD-ROMs to improve user access to the data and documentation. We surveyed all users of these CD-ROMs to obtain their evaluations of the products and will incorporate suggestions for further improvement into our 1997 data products.

Current Plans:

To satisfy customer expectations, for the 1997 Census we will create electronic products as our initial and primary means of data dissemination. Working with ACSD and the DADS groups in the Bureau, we will develop electronic products (CD-ROM and Internet) with a common look and feel and with user-friendly interfaces. We have started developing an integrated tool set for accessing data and metadata from internal, public and private data sources on our CD-ROMs and for the Internet that will include hypertext links, key word searches and data extraction. Further, software for viewing photocomposed table images and printing selected data on demand will be bundled with the other CD-ROM and Internet software.

Based on ongoing data product tasking, computer, and syntax requirements obtained from our major Federal users and other major user groups through the Data Access and Dissemination System (DADS) focus groups and Economic Programs initiated customer survey and contacts, Economic Programs will create a series of iterative prototype data products for CD-ROM and the Internet as part of the process of creating data products that better fit our customers' needs than do existing products. These prototypes will model the basic user interfaces we will use to allow data users to interact with data from the 1997 Economic and Agriculture Censuses on CD-ROMs and on the Internet. The user interfaces for these two media should be as similar as possible and employ state-of-the-art menuing and display techniques that maximize the amount of information made available to users on each screen about the availability of various data. We will provide windows-based software, for selecting, viewing, and manipulating data in portable data format (PDF) and non-PDF files, that replaces existing EXTRACT and GO software.

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Coordination with the DADS staff concerning all phases of these Economic Programs prototypes will be ongoing as part of the DADS prototype effort for the 2000 Decennial Census.

Features and functions we plan to develop, test, and evaluate (via continuing user feedback) for these prototypes include:

- (a) Ability to select predefined summary data tables and the ability to create simple user-defined tables from across existing predefined summary publication tables files from any published item; from user-defined fields derived using simple mathematical functions; from user-selected time periods, geography, and industry; containing modifiable default headers and stubs; containing user-defined output labels; presented in user-defined order; and with features including the ability to download in a file format that is importable into commonly used user-owned software (spreadsheets, word processors, etc.)
- (b) Hypertext links to metadata (including self documenting online help/documentation and information file formats) and to an expanding electronic warehouse of census data and related data both within the CD-ROM and outside the CD-ROM on the World Wide Web
- (c) Print-on-demand capability to a file/printer
- (d) Ability to search to locate data (build lists of tables where requested data exists) based on terms in the various subject glossaries and based on key word/synonym look-up
- (e) Ability to select and review predefined summary publication table files in viewable table file formats of publication level quality (PDF files using TIPS images processed through the Adobe Acrobat distiller) with bookmarks and thumbnails and hypertext links to the PDF file and to data files
- (f) Ability to run canned queries ("profiles" at progressively greater levels of geographic, industry, or product detail)
- (g) Ability to browse freely while maintaining current context (the ability to move from a particular kind-of-business for a specific geography to the particular kind-of-business across all similar geographies now exists in GO92 software)
- (h) Ability to change geographic levels
- (i) Ability to sort/rank
- (j) Ability to save output in a format that allows further manipulation in the system

- (k) Ability to save user-defined procedures
- (l) Ability to preview table set up prior to retrieving data and tables with retrieved data and prior to printing or downloading
- (m) Selected multimedia features

2. On-Line Access (CENDATA)

The Census Bureau maintained CENDATA for many years. It is an on-line data base of the most current and widely used facts, specializing in press releases and information on ordering the latest products. CENDATA is a simple, inexpensive method for customers to access economic/agriculture census and survey data.

Progress to Date:

We used CENDATA extensively to advertise products and summarize economic/agriculture statistics for the 1992 census.

Current Plans:

With the widespread availability of Internet access, we expect to ultimately discontinue product offerings via CENDATA by the end of 1996.

We will investigate the use of a FAX-on-demand system for the convenience of economic data customers.

3. Internet Access

The Census Bureau is actively investigating the range of uses for the Internet, among which is data dissemination. Through a coordinated effort between the Economic Internet Steering Group (EISG) and the Economic Products Strategy Team (EPST), we have developed a marketing plan for disseminating data on the Internet. We increased our customer base, improved accessibility to our data, and hope to increase revenues.

Progress to Date:

Economic Indicator data are now accessible from the Census Bureau Home Page, the Economic Home Page, and from within the program description. We are testing an Internet form to be used by the persons responsible for indicators. Additional functionality includes updating the Economic Home Page with the latest indicator data and generating a mail message to the White House with the information they requested.

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We have created a test server for the Economic Directorate Internet development.

We put on the Internet a GUI-based Economic Data Programs document ("Burgundy Book") containing textual profiles of all our Economic Programs and Products. This is the "first stop" to economic data users that enables interactive and intuitive search (via hypertext links, search boxes, etc.) for information they need. It will also include easy ordering methods for CD-ROM and other products. This document is an integral component of the Bureau's "The Economy" home page on our Internet site.

We have been placing economic press release data on the Internet since early 1995. For example, the semiannual Investment Plans Survey (IPS) press releases have been accessible on our Internet site since February 1995 and the Quarterly Financial Report (QFR) began offering its press releases, including summary data tables on the Internet since June 1995.

Current Plans:

Building on the Economic Programs' contribution to the Bureau's award winning Internet site, we plan to structure files and provide software that will enable our users to extract data from more than one economic sector as well as combine data from several censuses or survey time periods for historical comparisons. We plan to expand our on-line offerings to include data from all types of economic programs, including links to related products from other Bureau and other agency programs. Easy ordering methods for CD-ROM products, including the use of encryption software will be provided.

We have acquired the necessary secure software to process credit card orders on-line. Through our strategy of improved products and easy product ordering, we will speed access to our products and increase reimbursable revenue.

For our series of data product prototypes involving data delivery via the Internet, we will develop and test the features and functions included with our CD-ROM product plus those described below.

- (1) Ability to access the data included in Prototype Series 1 (CD-ROM) using a user interface as similar as possible to the CD-ROM version with features including:
 - (a) Software functionalities replicating the CD-ROM functions where ever beneficial (advancing Internet technology may allow us more functionality with the Internet products) or practicable
 - (b) Ability to restrict (prevent) access to various levels of data - this will enable the use of the same access system by external and internal users alike. This access system will include all data, metadata, and software available to subscribing external customers with this same data/software available also to internal users alike. This

access system will include all data, metadata, and software available to subscribing external customers with this same data/software available also to internal users for data analysis and customer service. The restrictions apply to the external availability of selected data/software to a fee only basis for subscribing/paying external users

- (c) Ability to preview selected restricted data levels (restricted to only selected data samplers or teasers) prior to ordering CD-ROM data or subscribing to our Internet online products

Developing, testing, and evaluating these prototypes is an essential component of implementing our product strategy for the 1997 Economic and Agriculture Censuses. Through these efforts we will:

- Participate as partners with the DADS staff in building DADS prototypes using Economic Programs data - promoting consistent user interfaces for all census data products
- Determine the basic user interfaces for electronic products (i.e., buttons and bars, pull down menus, etc.)
- Acquire developmental and programming skills for building and/or overseeing the development of windows-based data products for CD-ROMs and the Internet
- Develop working relationships with various areas involved in data product development, dissemination, and customer service (DADS, ACSD, ESMPD, EPCD, SSD, subject divisions, CPDO, CAMS, the Internet Steering Committee, and outside contractors), serving as the basis for forming a new dynamic organizational membership for implementing and maintaining an improved economic programs data dissemination system for 1997 and beyond.
- Determine more clearly what skills and data product components we can develop in-house and those for which we should contract out
- Generate a series of tangible prototypes on which we can solicit valuable external and internal user feedback via hands-on usage, for use as integral input to building data products that deliver the desired customer outcomes in terms of what they would like to do with the data and information we provide

F. Inter-Divisional Communication and Coordination

Conducting the census is an extremely complex endeavor involving hundreds, if not thousands of dependent and concurrent activities. With numerous organizational units and subunits assuming responsibility for these activities, coordination and communication between these units becomes critical to the success of the census. Information must be timely and accurate to make

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crucial decisions involving work load distribution, staff and work flow operations. Considering the volume of work to be processed, misinformed decisions could waste tens, or even hundreds of thousands of dollars.

1. Office Automation

Within the Economic Directorate, each division has developed its own office automation (OA) system. Consequently, incompatible software and hardware exists, making it unwieldy to share and update interdivisional electronic information. The economic area therefore still relies heavily on routing hard copy memoranda and documents. Implementing a uniform office automation system across all economic divisions will reduce staff support costs as well as eliminate delays, redundancies, and wasteful paper handling activities. For example, by implementing electronic document management the economic area could easily cut its paper usage in half, saving several hundred thousand pieces of paper and over \$100,000 annually.

Current Plans:

The Economic directorate has started to consolidate the LAN and Office Automation support in the ESMPD. We will standardize commonly used hardware and software to eliminate redundancy, simplify support, and increase efficiency of inter-divisional communication. This will partially be accomplished by presenting a common systems view to all Economic divisions.

2. Decision Support Systems/Groupware

Work-group technology enables inter-organizational, flexible sharing and update of data, documents, and processes. It is embodied in maturing technologies such as networked calendaring work-flow automation, document management and conferencing bulletin boards. Work-group tools will enhance communication capabilities thus resulting in more efficient overall processing.

Progress to Date:

We are developing directorate-wide Economic Information Support System (EISS). This system will include modules for document management and work flow, forms tracking/inventory, response rates, budget tracking, calendaring, a CD-ROM reference system and project management. The project management and budget tracking components are complete and are being used. The document management portion is in prototype. We anticipate giving access to 200-500 users in the next two years. This system will improve communications and data sharing in conducting operations connected with the 1997 Economic Census.

3. Management Information Systems (MIS)

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The importance of MIS cannot be understated. Accurate and timely progress reporting is essential for informed planning and decision making.

Progress to Date:

For the 1992 census we developed an MIS to track and control operational flows in Jeffersonville using a combination of automated information capture and manual data entry into the DEC minicomputer.

Current Plans:

For the 1997 census, we will further automate the entry of MIS information so that it is captured at the source of, or as a direct by-product of the actual activity. We will also broaden the scope of MIS to include a uniform project progress reporting system across all economic divisions. We will also investigate software with the capability to create "what if" scenarios. This will be a valuable aid in making decisions to adjust and reallocate operational resources.

G. Software Development

The migration from batch-oriented systems to interactive applications, which are inherently more difficult to develop, makes it imperative that we adopt more efficient methods for software development. As part of this new software development environment, the traditional paper-based, back and forth interaction between specification writers and system developers must evolve into a more cooperative, "shoulder-to-shoulder" effort. The use of rapid-application-development tools to build prototypes and other software development tools and techniques will also accelerate the system development process. Also, as our product strategy shifts from "paper based" to electronic products, we must develop software interfaces that suit these media.

Progress to Date:

We refined our software release and certification procedure which ensures rigorous testing of systems before release into production. We have streamlined this process, minimized paperwork, and improved ease of use.

We acquired video-based training for UNIX, TCP/IP and Visual Basic to assist in developing user interfaces that are platform independent.

We continue to utilize two CASE (Computer Assisted Software Engineering) tools for use in business process reengineering efforts and associated entity relationship design and documentation.

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We have formed several teams whose membership includes both specifications writers and system developers to develop new projects in a more cooperative environment. (Generalized Edit Team and StEPS team)

We continue to develop pilot projects using client/server design and technologies.

Current Plans:

We are developing the Standard Economic Processing System (StEPS) for post-collection processing of all current, periodic and one-time surveys. The benefits of this system include:

- improve timeliness for new surveys by eliminating analyst retraining and the development of custom survey processing software.
- decrease costs by reducing resources needed for system maintenance and for migration to other platforms.
- improve replicability of survey procedures in the area of data analysis and management information.
- increase reimbursable revenue by providing rapid system development for one-time, reimbursable surveys.

StEPS will provide basic survey processing functions including: receipt of collected data, links to prior and other data, name and address maintenance, mailout and follow-up, edits, imputation, analysis and review tools, correction capabilities, estimation, tabulation, disclosure, variance and product creation.

We plan to develop StEPS using SAS and other COTS software in a UNIX environment. Each analyst desktop device will have an X-windows emulator to access the UNIX servers.

We will train staff to acquire necessary skills to develop applications using new platforms, software and technologies, such as UNIX, SAS, Object Oriented tools, CASE tools and the Internet.

We will investigate On-Line Analytical Processing (OLAP) and multidimensional databases (MDD) for use in producing and disseminating electronic products.

4. IMPLEMENTATION SCHEDULE.

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PROJECT: Standard Economic Processing System for Surveys (StEPS)		
Milestone	Start	Complete
Requirements Definition	10/95	12/95
Functional requirements	03/96	06/97
Design/development specifications	04/96	07/97
System design/development	04/96	07/97
Prototype	04/96	12/96
Testing and Evaluation	06/96	09/97
Software rollout	10/96	10/97
Production/Implementation	01/98	12/99
Prepare/review/approve Acquisition documents	03/96	06/96
Conduct acquisition	05/96	05/97
System conversions	10/96	12/99

PROJECT: Improve SSEL Access by Analysts ⁴		
Milestone	Start	Complete
Requirements Definition	01/95	Done
Functional requirements	02/95	Done
Design/development specifications	04/95	Done
Prepare/review/approve Requirements	04/95	Done
Prepare/review/approve Acquisition documentation	05/95	Done
Conduct acquisition	09/96	10/96
Deliveries of equipment	11/96	12/96

PROJECT: SSEL Redesign and Conversion		
Milestone	Start	Complete
Concept Definition	06/95	04/96
Functional requirements	05/96	08/97
Design/development specifications	08/97	08/98

⁴ The above project will provide a platform to run SAS software. No custom additional software will be required. No additional training (other than SAS) or staff is required for this project.

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Design/development	08/97	08/99
Testing and Evaluation	08/98	08/2000
Production/Implementation	08/2000	07/2001

PROJECT: Standardization of Economic LAN Environment		
Milestone	Start	Complete
Requirements Definition	01/96	09/96
Functional requirements	01/96	09/96
Design/development specifications	01/96	09/96
Production/Implementation	07/96	10/97
Training	08/95	10/97
Prepare/review/approve Acquisition documentation	01/96	07/96
Conduct acquisition	09/96	12/98
Deliveries of equipment or software	09/96	12/98
System conversions	07/96	10/97

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Conversion of a single VAX to ALPHA on EPCVC3⁵		
Milestone	Start	Finish
1. Upgrade VMS and layered products to ALPHA compatible versions on EPCVC3 and EPCVC2		
a. Test and Upgrade Economic Area applications on test cluster	02/96	05/96
b. Upgrade VMS and layered products on EPCVC3	07/96	07/96
c. Upgrade VMS and layered product on EPCVC2/Deploy upgraded versions of applications as necessary	07/96	07/96
2. Upgrade EPCVC30 from VAX 7620 to DEC 7710 and add 20 GB of Raid Disk to EPCVC3 cluster	09/96	09/96

Conversion of the EPCVC2 and remainder of EPCVC3 to ALPHA		
Milestone	Start	Finish
1. Elimination of ALPHA dependencies from Economic Area Applications		
a. Convert all screens from TDMS to other screen handlers	02/96	11/96
b. Eliminate need for HYPERCHANNEL (convert to FTP or move application from UNISYS)	05/96	12/96
2. Recompile/Relink/Test ALPHA versions of Economic Area production applications	09/96	02/97
3. Convert ALPHA computers to ALPHA on EPCVC2/Deploy ALPHA Versions of Application Executibles	02/97	05/97
4. Convert remaining VAX computers in EPCVC3 to ALPHA	03/97	05/97

PROJECT: Economic Executive Information System (EEIS)		
Milestone	Start	Complete
Requirements Definition	03/95	Done
Functional requirements	03/95	Done
Design/development specifications	04/95	Done
Design/development	06/95	Done
Prototype	07/95	Done

5 One of the CPUs should be removed from EPCV 30 and placed into a VAX 7610 on the production cluster before the conversion.

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PROJECT: Economic Executive Information System (EEIS)		
Milestone	Start	Complete
Testing and Evaluation	10/95	Done
Conduct Acquisition	03/96	09/96
Production/Implementation	11/95	06/96

5. Acquisitions

Desktop Devices		
Type of Equipment	FY 1996	Planned FY 1997
Personal Computers	200	300
PCs, Macs, PowerPCs used as servers	3	10
Laptops/Notebooks	5	10
RISC workstations used as servers (UNIX)	2	2
Memory (MB)	1,000	1,300
Processor Motherboards (Pentium 166/200)	3	2
X-Terminals	10	
Laser printers, Small B/W	16	20
Color printers	1	5
Tape drives	2	
Disk storage units (GB) (For PCs and W/S)	165	130
Mass storage devices (4mm, 8mm)	12	5
Optical storage devices (CD Jukeboxes)	4	2
CD-Recording devices		5
Operations/maintenance contracts (renewed)	1	
UPS	10	

Other Equipment		
Type of Equipment	Planned FY 1977	Planned FY 1998

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DPD Microfilm Cameras, Sorters, Parts, etc. ⁶		
DPD Terminals/PCs ⁷	1,300	67
Ektajet Printers	2	
Forms Printers (Lease)	2-3	2-3
Workstations ⁸	6	4
Mass Storage ⁹	130GB	260GB

6. Refurbish and replacement parts.

7. Replaces old (1989) DEC VT terminals (1,000). Every effort will be made to utilize existing terminals.

8. Production workstations for StEPS Project, Generalized Edit Implementation, SSEL Warehouse, and Survey Processing Reengineering.

9. Magnetic Storage for Digital Minicomputers (Maintenance costs will be assumed by the IT Directorate).

Plan Title:	Economic and Agriculture Census and Surveys Support System
Plan Number:	CB-EF-94-01-E
Plan ID:	IT

PART II - ANNUAL PLAN FOR

STANDARD STATISTICAL ESTABLISHMENT LIST (SSEL) COMPANY ORGANIZATION SURVEY (COS) COUNTY BUSINESS PATTERNS (CBP)

1. Program Description

A. Purpose

SSEL—The SSEL is a complete and continuously maintained list of United States business establishments and their parent firms. For each of these business units, the SSEL contains a unique identifier (census file number); contact information, including business name and address; industrial classification; geographic classification; basic size/activity measures (employment and payroll); and other control and status information.

COS—The COS is an annual survey that provides information needed to maintain SSEL records for multiestablishment enterprises. Collections from a rotating panel of firms update an inventory of the establishments that the firms operate. The inventory includes name and address, industrial classification, and size/activity measures (employment and payroll) for each establishment; it also identifies new/acquired establishments, establishments that have been sold to other firms, establishments that are idle, and establishments that are closed.

CBP—The CBP program produces an annual series of statistical publications based on administrative data, COS results, and other economic surveys' results recorded in the SSEL. These products summarize data for number of establishments, payroll, and employment by Standard Industrial Classification (SIC) and employment size class. Tabulations present these data for the United States, states, the District of Columbia, Puerto Rico, counties, metropolitan areas, and ZIP Code areas. The Census Bureau distributes CBP products by means of printed reports and electronic media, including CD-ROM, the Internet, tape, and diskette.

B. Benefits

SSEL—The SSEL is a multipurpose business register for the Census Bureau's economic programs. Censuses and surveys use the SSEL as a survey frame for selecting data collection panels. The SSEL is a fundamental part of the economic programs' infrastructure and is critical to the Census Bureau's mission.

COS—The COS is an SSEL maintenance/proving survey. It collects information about the composition and structure of multiestablishment firms. Since this information presently is not available from administrative records or other sources, the COS is essential for keeping the SSEL's coverage of multiestablishment firms accurate and up to date.

CBP—The CBP program produces detailed industry and geographic area statistics for all classifications except agricultural production, railroads, private households, and public administration. These data are used widely by Government, business, and other organizations to analyze economic activity for the United States, regions, states, and small areas. There is no other annual source of business statistics with comparable detail.

2. Architecture Status

SSEL—During the last year, we continued migrating remaining UNISYS systems for administrative records processing to the DEC platform. Further, we are proceeding with work needed to migrate components of the SSEL/COS editing system to the DEC platform and expect to begin edit production there during February 1997. When this final edit conversion is complete, the SSEL and closely related systems will operate exclusively in a DEC environment.

COS—We are proceeding with work needed to migrate remaining UNISYS components of the SSEL/COS editing system to the DEC platform and expect to begin edit production there during February 1997. When this final edit conversion is complete, the COS will operate exclusively in a DEC environment.

CBP—We are proceeding with work needed to migrate remaining UNISYS components of the CBP cell edits and tabulation system to the DEC platform and we expect to complete this conversion during 1997. When this conversion is complete, the CBP program will operate in two environments: the DEC platform for large-scale batch applications such as cell edits, tabulations, and publication (TIPS) preparation; networked personal computers for interactive data access, analysis, and corrections and for special tabulations.

3. Programmatic and IT Objectives

SSEL—Long-range objectives for the SSEL include completely redesigning the database, interactive applications, batch processes, and all related support systems; our goal is to implement a new business register in advance of the 2002 economic censuses, probably on a new platform. Our objectives for the next fiscal year include: (1) continue to improve access to the SSEL and provide support for flexible, wide-ranging user queries; (2) integrate the nonemployers processing

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with other administrative records processing; (3) expand the SSEL's annual content to include receipts measures; (4) make progress on improving the accuracy and timeliness of SSEL SICs; (5) begin a regular program of register quality measurement; (6) allow SSEL users to record and/or browse annotations giving important explanatory information; (7) improve productivity for SSEL maintenance and census processing operations; and (8) make progress toward migrating the SSEL/COS editing system to the DEC platform and improve the system's effectiveness.

COS—Our objectives for the next fiscal year include: (1) reduce processing cost and response burden for the annual COS without degrading the collection of critical coverage information; (2) make overall improvements in productivity and timeliness for COS operations; and (3) make progress toward migrating the SSEL/COS editing system to the DEC platform and improve the system's effectiveness. .

CBP—Our objectives for the next fiscal year include: (1) improve procedures for identifying and correcting problems in establishment data; (2) improve the effectiveness of analysis activities; (3) reduce publication costs and emphasize electronic products while maintaining ease of data user access; and (4) make progress toward migrating cell edits and tabulation processes to the DEC platform.

4. Status

A. Accomplishments/Progress

SSEL—We updated and modernized our administrative records quality assurance processes by redesigning them as SAS applications residing on the DEC platform. We also completed work needed to add receipts measures and nonemployer establishments to the SSEL.

COS—We have expanded the COS' use of electronic reporting, mostly by increasing the number of companies that complete a Computer Self-Administered Questionnaire (CSAQ); the number of COS electronic reporters for the 1995 survey period should exceed 300. We continue to improve our procedures for applying laser printing technology to imprinting and collating COS mailing pieces. We implemented new procedures to reduce the size of the COS data collection by targeting it more effectively at companies that have undergone a change in organization or operating status. Finally, we have improved the timeliness of COS data collection and processing by an additional month.

CBP—We have improved effectiveness and timeliness of CBP operations, mostly by enhancing processes carried out on the microcomputer network and by improving the efficiency of data analysis; this has yielded a 2 - 3 month improvement in the timeliness of CBP publications for 1993 and 1994. Further, we are reducing publication costs by streamlining printed reports and increasing emphasis on electronic data products.

B. Current Plans

SSEL—Our plans for the next fiscal year include: (1) refine the newly implemented SAS-based SSEL access tools and move them to a UNIX workstation; (2) implement new administrative records processes needed to add annual receipts measures to the SSEL; (3) complete a study on administrative classifications and develop updated procedures for deriving SICs from this source; (4) implement rigorous quality assurance measures for the SSEL; (5) add a notepad feature to selected interactive routines; (6) implement new interactive routines that will help improve productivity for SSEL maintenance and 1997 Economic Census processing; and (7) make progress toward the February 1997 production target for a redesigned SSEL/COS editing system.

COS—Our plans for the next fiscal year include: (1) make overall improvements in productivity and timeliness for COS operations, particularly completeness and coverage referral processing; and (2) develop and test programs for a redesigned SSEL/COS editing system.

CBP—Our plans for the next fiscal year include: (1) improve programs for establishment data editing and imputation; (2) provide enhanced tools for PC-based data analysis, error localization, and correction; (3) reduce publication costs by revising the TIPS preparation process to be more selective, increase emphasis on electronic products, and begin preparations for print/FAX on demand data dissemination; and (4) begin development work needed to migrate cell edits and tabulation processing to DEC or networked microcomputer platforms and to move these procedures to generalized/standardized systems.

5. Implementation Schedule

The following implementation schedules cover four major development/redevelopment projects for General Economic Statistics. Other plans for the upcoming fiscal year are adjustments and incremental improvements to existing systems, and we will carry them out as maintenance upgrades.

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A. SSEL

PROJECT: SAS-Based SSEL Access Tool		
Milestone	Start	Complete
Develop functional requirements	Done	Done
Design system	Done	Done
Develop specifications	Done	Done
Write/Test individual programs	Done	Done
Test full system	07/95	Done
Implement	10/95	Done

PROJECT: Receipts Processing (Includes Nonemployers)		
Milestone	Start	Complete
Develop functional requirements	Done	Done
Design system	Done	Done
Develop specifications	In progress	Done
Write/Test individual programs	In progress	Done
Test full system	In progress	Done
Implement	In progress	Done

B. COS

PROJECT: COS (Completeness and Coverage) Editing System Redevelopment		
Milestone	Start	Complete
Develop functional requirements	In progress	Done
Design system	In progress	Done
Develop specifications	10/95	Done
Write/Test individual programs	02/96	10/96
Test full system	11/96	01/97
Implement	02/97	

C. CBP

PROJECT: Redevelop CBP Cell Edit and Tabulation Systems		
Milestone	Start	Complete
Develop functional requirements	In progress	Done
Design system	In progress	01/96
Develop specifications	01/96	04/96
Write/Test individual programs	03/96	08/96
Test full system	09/96	10/96
Implement	11/96	

6. Acquisitions (if applicable)

Not applicable. Hardware acquisitions for General Economic Statistics are covered by overall plans for Economic and Agriculture Censuses and Related Surveys Support Systems.

Plan Title:	Economic and Agriculture Census and Surveys Support System
Plan Number:	CB-EF-94-01-E
Plan ID:	IT

PART II - ANNUAL PLAN FOR THE MANUFACTURERS' SHIPMENTS, INVENTORIES AND ORDERS (M3) SURVEY

1. Program Description

A. Purpose

The M3 survey provides broad-based monthly statistical data on current economic conditions and indications of future production commitments in the manufacturing sector. The survey provides information for a principal federal economic indicator and is the only source of estimates of new and unfilled orders and monthly current dollar domestic manufacturing shipments, inventories, and orders.

B. Benefits

The results of the survey are used extensively by the executive branch of the Government in developing economic, fiscal, and monetary policy. The President's Council of Economic Advisers, the Federal Reserve Board, and the Treasury Department are some of the regular users of these data. The business community, including trade associations and corporate economists, also recognizes the usefulness of these data to industrial analysis.

2. Architecture

The company level survey review is conducted on the DEC. The resulting I industry totals are then uploaded to the Unisys where they are aggregated, seasonally adjusted using X-11 ARIMA and the results are stored in Timebase. Data from Timebase are then downloaded to a PC where publication tables are created using WordPerfect.

3. IT Objectives

Since the Bureau will no longer be supporting Timebase, one of our objectives is to investigate other time series databases or develop our own if necessary to replace Timebase.

We will do the interactive screen conversion from TDMS to a replacement; and RDO conversion also.

We will migrate off the DEC to another platform, possibly workstations.

We hope to implement the FAX- readable (PFIRS) system in our monthly production. This would require the use of the DocuPrint printer in DPD.

4. Status

A. Accomplishments/Progress

1. A staff member is assigned to the Timebase development committee.
2. We are testing the Timebase system on DEC.
3. We have done some testing of the X-12 on the DEC.
4. We tested PFIRS with 100 M3 respondents. We have successfully printed the form on the DocuPrint printer.
5. We implemented a batch program for Advance Inventory requested by the Director.
6. We are currently implementing a method to control the access to our source code.
7. We are developing a method to replace our old TDMS screens with SAS screen. Progress is slow because this is a new technology.

B. Current Plans

Architecture will become mixed between DEC and UNIX workstation as a result of implementing SASbase. If SASbase is not ready by the time UNISYS is completely gone, we will process using Timebase on the DEC. In any event, we will move from the UNISYS Timebase to the DEC Timebase only or in some combination with SASbase (if available) as an intermediate step to ensure that we can continue to process our surveys without interruption. Movement entirely to SASbase depends upon completion and capabilities of the system.

5. Implementation Schedule

PROJECT: Timebase Replacement		
Milestone	Start	Complete
Functional Requirements	In progress	Done
Prototype	August 1995	October 1996
Develop specifications	In progress	Done
Write/Test programs	August 1996	October 1996
Test full system	November 1996	December 1996
Test full system concurrently	January 1997	March 1997
Implement	April 1997	July 1997

6. Acquisitions (if applicable)

Not Applicable

Plan Title:	Economic and Agriculture Census and Surveys Support System
Plan Number:	CB-EF-94-01-E
Plan ID:	IT

PART II - ANNUAL PLAN FOR ANNUAL SURVEY OF MANUFACTURES (ASM)

1. Program Description

A. Purpose

The Annual Survey of Manufactures (ASM) is used to provide key measures of manufacturing activity during intercensal years for the public and private sector. Since 1949, the ASM has served as the primary source of basic statistics for manufacturing industries.

B. Benefits

The Bureau of Labor Statistics uses the ASM to calculate the annual productivity series, to update the producer price indexes, and to calculate weights when new components are added. The Federal Reserve Board uses the ASM to prepare the Index of Industrial Production. The Bureau of Economic Analysis uses the ASM to prepare an annual update of the Gross Domestic Product (GDP) and to weight the GDP deflators. The International Trade Administration uses it to forecast future industrial activity as part of the U.S. Global Trade Outlook report. State and local agencies use ASM data to forecast economic conditions and determine economic policy. Private industry and trade associations use ASM data to plan operations, for market analysis, and to make investment, plant location and production decisions.

The Census Bureau uses the data internally to benchmark and reconcile monthly and quarterly data on manufacturing production and inventories.

2. Architecture Status

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ASM data continue to be processed on both the UNISYS and DEC platforms. We are planning the conversion of the remaining sub-systems from the UNISYS to DEC so that the UNISYS can be phased out at the end of 1997.

3. IT Objectives

Our objective is to develop and test a new edit system to run on DEC. We plan to begin testing in June 1996 (1995 ASM survey year) using the 1995 ASM as the test.

Our primary goal is to move off the UNYSIS for the 1996 ASM survey year. We are also redesigning these edit sub-systems to create a simpler and more efficient edit. This should result in savings of time and money.

4. Status

A. Accomplishments/Progress

New Technologies - In 1995 for the 1994 ASM, a prototype test of an "electronic questionnaire" was sent to a small panel of companies. This Computerized Self Administered Questionnaire (CSAQ) will allow respondents, using their own hardware and equipment, to directly input requested data and return it in a standardized format via modem or diskette. The data will be in the same format as keyed data entering the ASM editing system. If this project is successful, then it will be expanded for the 1995 ASM to include more companies. We hope that eventually most large companies will elect to report using this method. We expect to realize major data keying dollar savings using this technology, while at the same time improving quality of the data. We are also investigating the use of new, more powerful analyst review tools such as PC-IQ and SAS. This should also result in savings in time and resources and improve data quality. We are also including an 800 toll-free number on the 1995 ASM questionnaires mailed in January 1996. This system will also include an automatic call distribution system.

Internet - We developed home pages for our Economic Census data to facilitate access and provide timely data to our users, another strategic planning goal.

B. Current Plans

We continue our efforts to improve the quality and timing of the ASM. The CSAQ and edit redesign work are ongoing and the teams assigned to the projects are providing specifications and testing on schedule. We should be off the UNISYS by the end of 1997. Due to the CSAQ technology, we are also in a position to realize ASM data keying savings. This may also have applications for the 1997 Census of Manufactures. We also plan to continue our testing of new analyst review tools.

5. Implementation Schedule

PROJECT: ASM Edit Redesign		
Milestone	Start	Complete
Develop functional requirements	In progress	September 1995
Design system	In progress	January 1996
System procurement	NA	NA
Develop specifications	In progress	April 1996
Prototype	May 1996	June 1996
Write/Test individual programs	November 1995	September 1996
Training	July 1996	October 1996
Test full system	June 1996	September 1996
Implement (1996 ASM)	January 1997	

6. Acquisitions (if applicable)

Remaining acquisitions will be covered under the procurement plans for the Economic Directorate.

Plan Title:	Economic and Agriculture Census and Surveys Support System
Plan Number:	CB-EF-94-01-E
Plan ID:	IT

PART II - ANNUAL PLAN FOR CURRENT INDUSTRIAL REPORTS (CIR)

1. Program Description

A. Purpose

The purpose of the Current Industrial Reports (CIR) is to provide timely and accurate intercensal estimates of production and shipments of specific manufactured products for economic policy needs and for market analysis, forecasting, and decision making in the private sector.

B. Benefits

The CIR data aides the Federal Reserve Board in preparing the monthly index of industrial production. It helps the Bureau of Economic Analysis prepare quarterly estimates of the Gross Domestic Product (GDP). In addition, the International Trade Administration (ITA) and the International Trade Commission (ITC) use the CIR data to monitor the effect of international trade on domestic production. Also, ITA and ITC use the CIR data to assess production trends and forecast future industrial activity. The Bureau of Labor Statistics (BLS) uses CIR data to develop price indexes and estimates of productivity. Also, private industry uses CIR data to monitor the effect of international trade on domestic production, evaluate relationship between company and industry performance, market analyses, assess current business conditions, and plan future operations.

2. Architecture Status

CIR survey data continue to be processed on both the DEC and UNISYS platform

3. IT Objectives

We plan to migrate TIMEBASE and CIR Foreign Trade Imports and Exports listings from the UNISYS mainframes to the DEC.

We will implement a standard barcode check in system.

We will complete the Printronix to DocuPrint conversion for forms imprinting.

4. Status

A. Accomplishments/Progress

1. We performed substantial testing of the DEC Timebase system.
2. We converted the Card Type 2 annual surveys to the Docuprint printer.
3. CIR, Foreign Trade Imports and Exports listings have been moved to DEC. We will soon replace Hypercopy with another method of transferring files to and from the UNISYS.
4. An 800 toll-free number has been included on the CIR questionnaire. The call distribution system has been implemented.

B. Current Plans

We are continuing our efforts to improve all aspects of the CIR system. The migration to the DocuPrint printer will provide us with time to redesign our forms and possibly make them more consistent with other forms in the division. The movement of TIMEBASE and CIR Foreign Trade listings from the UNISYS to the DEC will complete our move of the entire CIR system to the DEC.

Architecture will become mixed between DEC and UNIX workstations as a result of implementing SASbase. If SASbase is not ready by the time UNISYS is completely gone, we will process using Timebase on the DEC. In any event, we will move from the UNISYS Timebase to the DEC timebase only or in some combination with SASbase (if available) as an intermediate step to ensure that we can continue to process our surveys without interruption. Movement entirely to SASbase depends upon completion and capabilities of the system.

5. Implementation Schedule

N/A

6. Acquisitions (if applicable)

Remaining acquisitions will be covered under the procurement plans for the Economic Directorate.

Plan Title:	Economic and Agriculture Census and Surveys Support System
Plan Number:	CB-EF-94-01-E
Plan ID:	IT

PART II - ANNUAL PLAN FOR

SURVEY OF POLLUTION ABATEMENT COSTS AND EXPENDITURES (MA-200)

1. Program Description

A. Purpose

This program provides annual statistics for the Nation and smaller geographic areas (regions and states) of capital expenditures by type of pollution abated and abatement technique, operating cost by form of abatement and type of cost, and cost recovered through abatement activities by form of pollutant.

B. Benefits

The data are widely used by policymakers, economists and others for economic forecasting, product planning and market analysis and measurement of the effects of environmental legislation.

2. Architecture Status

MA-200 data continue to be processed on the DEC. There are no plans to change to another system.

3. IT Objectives

This survey was suspended for 1996. If this survey is reinstated in 1997, we will:

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- Replace UNISYS Timebase software with SASbase (on DEC)
- Upgrade to latest version of VMS (VAX or ALPHA)
- Implement the Key Entry III data entry software

4. Status

A. Accomplishments/Progress

We were unable to automate production scheduling, institute data entry by respondents, or offer publications through electronic means due to resource and workload constraints.

We continue to develop diskettes of publications in Lotus 1-2-3 format to distribute to data users.

B. Current Plans

At this time, the status of this survey is uncertain.

5. Implementation Schedule

There are no new projects underway at this time.

6. Acquisitions (if applicable)

Remaining acquisitions will be covered under the procurement plans for the Economic Directorate.

Plan Title:	Economic and Agriculture Census and Surveys Support System
Plan Number:	CB-EF-94-01-E
Plan ID:	IT

PART II - ANNUAL PLAN FOR SURVEY OF INDUSTRIAL RESEARCH AND DEVELOPMENT (R&D)

1. Program Description

A. Purpose

This program provides annual statistics for the Nation and smaller geographic areas (regions and states) of the cost for basic and applied research and development, employment of scientists and engineers, energy research, pollution abatement research, and company research and development performed outside the United States.

B. Benefits

The data are widely used by policymakers, economists and others to monitor federal spending on research and development, regulate tax credits for research and development by companies overseas, determine appropriate levels of funding for energy research, develop satellite accounts for national income tables, prepare legislation to protect the environment, and for product planning and market analysis.

2. Architecture Status

R&D data continue to be processed on the DEC.

3. IT Objectives

In 1997, we will:

- Upgrade to the latest version of VMS (VAX or ALPHA).

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- Implement the Key Entry III data entry software.
- If SASbase software (for time series) becomes, available, we will migrate our time series processing to DEC or UNIX Workstation.

We are also proposing to send a diskette-based CSAQ with the form to large panel members. We will modify the processing and tabulation systems to accomodate sponsor changes in publication level. Implementation of TDE is also being considered.

4. Status

A. Accomplishments/Progress

We introduced the use of a TDE-based fax-back system which allowed respondents to receive a faxed copy of the RD-1A survey form and instructions within 24 hours of their call.

We also tested a Computerized Self-Administered Questionnaire (CSAQ) among a small group of known R&D-performing companies. Based on the results of this test, we will explore appropriate methods for making the CSAQ available to additional respondents.

B. Current Plans

We are preparing a proposal for sponsor consideration to extend diskett-based CSAQ to large panel members.

We are discontinuing the TDE-based FAX-back system because of the volume of calls from companies unfamiliar with the form.

5. Implementation

No new projects are underway for fiscal year 1996.

6. Acquisitions (if applicable)

Remaining acquisitions will be covered under the procurement plans for the Economic Directorate

Plan Title:	Economic and Agriculture Census and Surveys Support System
Plan Number:	CB-EF-94-01-E
Plan ID:	IT

PART II - ANNUAL PLAN FOR SURVEY OF PLANT CAPACITY (MQ-C1)

1. Program Description

A. Purpose

This program provides statistics on the rates of capacity utilization in U.S. manufacturing plants.

B. Benefits

The data are widely used by policymakers, economists and others to formulate monetary policy, analyze industrial capabilities, and identify industries with potentially adverse import penetration.

2. Architecture Status

1994 MQ-C1 survey data were processed primarily on the DEC, although some programs are still based on the UNISYS. There are tentative plans to conduct the survey in FY 1997, pending final budget decisions.

3. IT Objectives

If we conduct this survey in FY 1997, we will modify or newly develop edit, estimation and publication systems to accomodate changes in survey content and methodology.

4. Status

A. Accomplishments

The 1996 survey included a comprehensive review of 6 years of data using the new survey format.

B. Current Plans

See "IT Objectives".

5. Implementation

No projects will get underway for fiscal year 1997 until final budget is decided.

6. Acquisitions (if applicable)

Remaining acquisitions will be covered under the procurement plans for the Economic Directorate.

Plan Title:	Economic and Agriculture Census and Surveys Support System
Plan Number:	CB-EF-94-01-E
Plan ID:	IT

PART II - ANNUAL PLAN FOR MANUFACTURING ENERGY CONSUMPTION SURVEY (MECS)

1. Program Description

A. Purpose

This program provides triennial statistics on energy consumption in the manufacturing sector at the national and divisional levels. The Census Bureau conducts MECS for the Department of Energy.

B. Benefits

MECS data are widely used by policymakers, economists, and others to analyze national and divisional energy consumption. The data allow for tracking the efficiency of energy consumption, flexibility of fuel consumption, penetration of technologies, and involvement in energy-management programs in the manufacturing sector. MECS also provides information to identify and anticipate external peak electricity demands that might result in the postponement of, or decreased need for, investment in new power generation facilities.

2. Architecture Status

MECS data continue to be processed on the DEC using the Current Industrial Reports (CIR) processing system.

3. IT Objectives

In 1997, we will

- Continue to provide analysts with commercial off-the-shelf (COTS) software for interactive data querying and analysis.
- Upgrade to the latest version of VMS (DEC or ALPHA)
- Implement the Key Entry III data entry software.

4. Status

A. Accomplishments/Progress

1. New commercial off-the-shelf (COTS) software - In FY 1996 we developed canned queries and analysts are now able to use PC IQ for 85 percent of their searches.
2. Automated disclosure - When the 1991 MECS survey results were produced, we performed complementary disclosure manually. During FY 1996, we tested two automated disclosure programs on the 1991 MECS. After review, the Bureau's disclosure program was selected for use. This program will allow us to provide the 1994 and later data to our customer with better coverage and in a more timely matter.

B. Current Plans

Work will continue to develop canned queries for the analysts to use on PC IQ and SAS RQ. We plan to evaluate SAS for Windows as another query tool. The use of the COTS should enable us to search our database, freeing programming resources, and still meet our target date to release data in calendar year 1996.

5. Implementation Schedule

PROJECT: Manufacturing Energy Consumption Survey Query Tool Development		
Milestone	Start	Complete
Requirement definitions	May 1995	Done
Develop function requirements	May 1995	Done
Design/development specifications	March 1995	Done
Design/development	In progress	Done
Production implementation	August 1995	Done
COTS s/w evaluation	In progress	Done
Training	September 1995	Done
Conduct acquisitions	February 1995	Done
Deliveries of equipment or software	May 1995	Oct. 96

6. Acquisitions (if applicable)

The acquisition for PC IQ was paid for by sponsor funding.

Plan Title:	Economic and Agriculture Census and Surveys Support System
Plan Number:	CB-EF-94-01-E
Plan ID:	IT

PART II - ANNUAL PLAN FOR SURVEY OF ENVIRONMENTAL PRODUCTS AND SERVICES

1. Program Description

A. Purpose

This survey is being conducted for the first time. It is designed to provide statistics for the Nation of the output and exports of goods and services that control, reduce, and remediate pollution.

B. Benefits

The data are expected to be used by policymakers, economists and others to measure the economic impact of the production of environmental goods and services and the effect of the implementation of the Environmental Technologies Exports Initiative, the Clean Air Act, and other environmental statutes.

2. Architecture Status

The processing system for this survey will be on workstation using SAS software.

3. IT Objectives

We will develop a portable system capable of running on a variety of platforms.

4. Status

We are finalizing the OMB package and planning the design of the system.

5. Implementation Schedule

Data collection is scheduled to begin in June 1996. Final products will be delivered in early 1997.

6. Acquisitions (if applicable)

Acquisitions will be covered under the procurement plans for the Economic Directorate

Plan Title:	Economic and Agriculture Census and Surveys Support System
Plan Number:	CB-EF-94-01-E
Plan ID:	IT

PART II - ANNUAL PLAN FOR SURVEY OF CONSTRUCTION (SOC)

1. Program Description

A. Purpose

This program provides monthly, quarterly, and annual statistics for the nation, inside and outside metropolitan area, the four regions, and selected metropolitan areas on the number of housing unit started, authorized but not started, completed, and under construction. It provides statistics on new one-family homes sold and for sale. Also, it provides annual and quarterly statistics on characteristics of new housing.

B. Benefits

The data on housing units started and completed and new one-family homes sold and for sale are principal economic indicators. Policymakers, planners, business persons, and others use these data to formulate economic policy, control growth and plan for local services and to develop production and marketing plans.

2. Architecture Status

SOC data continue to be processed on the UNISYS. The development of a new system will begin in FY 1996. Plans are to process on a local area network (LAN), using NT workstation and/or UNIX workstation. The move to the UNISYS has been delayed due to work in progress to convert the data collection to CAPI.

3. IT Objectives

Our first objective is to move the data collection to CAPI. We plan to do this in phases: 50 percent of the sample in May 1996 (April 1996 survey month) and the remaining 50 percent in November 1996 (October 1996 survey month).

4. Status

A. Accomplishments/Progress

1. Conversion to CAPI - In FY 1995, we began testing the system, started the field representative training, and conducted a pretest.
2. Internet - We developed home pages for our economic indicators to facilitate access and provide timely data to our data users, another strategic planning goal.

B. Current Plans

1. We plan to continue the work on converting to CAPI. During FY 1996, we plan to conduct a dress rehearsal with 10 percent of the sample and then convert an additional 40 percent.
2. We plan to begin the work on the move from the UNISYS in FY 1996. This work depends on the progress of the work on the conversion to CAPI.

5. Implementation Schedule

PROJECT: Survey of Construction - Conversion to CAPI		
Milestone	Start	Complete
Develop functional requirements	April 1992	Done
Design laptop system	January 1993	Done
Develop specifications for processing	June 1994	Done
Write/Test instrument programs	June 1993	September 1995
Write/Test processing programs	June 1994	October 1995
Train field representatives-10 percent	October 1995	October 1995
Test full system (conduct dress rehearsal)	November 1995	March 1996
Train field representatives-40 percent	April 1996	April 1996
Implement - 50 percent	April 1996	October 1996
Train field representatives-50 percent	October 1996	October 1996

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PROJECT: Survey of Construction - Conversion to CAPI		
Milestone	Start	Complete
Implement - other 50 percent	November 1996	

6. Acquisitions (if applicable)

Not applicable

Plan Title:	Economic and Agriculture Census and Surveys Support System
Plan Number:	CB-EF-94-01-E
Plan ID:	IT

PART II - ANNUAL PLAN FOR CONSTRUCTION PROGRESS REPORTING SURVEYS (CPRS)

1. Program Description

A. Purpose

This program provides monthly estimates of the amount spent for the construction of private nonresidential buildings (NR), multifamily residential buildings (2+), and state and locally owned construction projects (SL), and quarterly estimates of expenditures for residential improvements and repairs (SORAR).

These data are used to develop monthly estimates of the value of new construction put in place, a major economic indicator. The data are further used for direct input to the gross domestic product estimates in the national income and product accounts.

B. Benefits

These statistics are used by all levels of government to evaluate economic policy, to measure progress toward national goals, to make policy decisions, and to formulate legislation. In addition, a variety of private businesses and trade organizations use the data to estimate the demand for building materials and to schedule production, distribution, and sales effort.

2. Architecture Status

CPRS data for NR and SL continue to be processed on the DEC with the exception of tabulation, imputation, and variance functions which will be added during FY 1996.

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3. IT Objectives

Our primary goal is to add 2+ and SORAR to the DEC interactive processing system during FY 1996. We will also attempt to complete the conversion of all tabulation, imputation, and variance programs from UNISYS to DEC by the end of FY 1996.

4. Status

A. Accomplishments/Progress

During FY 1995, we made enhancements to the existing CPRS system and began work to include 2+ and SORAR. We also expanded our electronic data capture capabilities through negotiations with the contractor providing our universe of construction projects. This effort reduced clerical keying thereby reducing costs.

B. Current Plans

The CPRS system will be expanded to include 2+ and SORAR. Existing tabulation, imputation, and variance programs will be modified and moved to the DEC platform. We also plan to enhance graphic capabilities.

5. Implementation Schedule

PROJECT: CPRS Redesign- Phase II (2+ and SORAR)		
Milestone	Start	Complete
Develop functional requirements	October 1994	December 1994
Design system	October 1994	June 1995
Develop specifications	January 1995	December 1995
Write/Test individual programs	February 1995	September 1996
Training	July 1995	June 1996
Test full system	October 1996	December 1996
Implement	December 1996	

6. Acquisitions (if applicable)

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No acquisitions are planned.

Plan Title:	Economic and Agriculture Census and Surveys Support System
Plan Number:	CB-EF-94-01-E
Plan ID:	IT

PART II - ANNUAL PLAN FOR MONTHLY BUILDING PERMITS SURVEY (MBP)

1. Program Description

A. Purpose

This program provides monthly and annual statistics for the Nation and smaller geographic areas (states, metropolitan areas, etc.) of the number and value of residential and nonresidential buildings authorized by building permits. For residential buildings, it also provides number of housing units. As of January 1996, the residential portion of this survey will be discontinued due to budget problems.

The data on housing units are used to produce a component of the **Index of Leading Economic Indicators** and estimates of **Housing Starts**, and to update sampling frames for the Census Bureau's demographic surveys.

B. Benefits

The data are widely used by policymakers, economist and others to analyze national and regional economic conditions. The detailed geographic data are particularly useful to businessmen/women to estimate mortgage demand, plan production and develop marketing plans; state and local planners to plan for local services; and local media for economic reports.

2. Architecture Status

BPS data continue to be processed on the UNISYS. The development of a new system is underway. Plans are to process on a local area network (LAN), using UNIX workstations.

3. IT Objectives

Our objective is to develop and test a new system to run on a LAN. We plan to begin parallel processing in October 1996 (September 1996 survey month).

Our primary goal is to move off the UNISYS. We are also redesigning the system to streamline operations and provide for interactive processing. This should result in savings of time and money.

4. Status

A. Accomplishments/Progress

1. During FY 1995, we (Economic Directorate) developed functional requirements, began work on the design, and procured the hardware. We tested Visual Basic for screen development, PC IQ and SAS for (interactive) querying, and Windows NT for the operating system.

This is a pilot project within the directorate to develop a system trying to use commercial off-the-shelf (COTS) software to the extent possible. The re-engineering of our processes is a strategic planning goal.

2. Internet - We developed home pages for our economic indicators to facilitate access and provide timely data to our data users, another strategic planning goal.

B. Current Plans

Work will continue on the new computer system. Near-term, we plan to evaluate SAS for tabulating and begin drafting specifications and writing programs as needed. Based on progress to date, the use of COTS should enable us to meet our target date to be off the UNISYS by the end of CY 1996.

5. Implementation Schedule

PROJECT: Building Permits System Redesign		
Milestone	Start	Complete
Develop functional requirements	In progress	August 1995
Design system	In progress	November 1995
System procurement	July 1995	September 1995

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PROJECT: Building Permits System Redesign		
Milestone	Start	Complete
Develop specifications	July 1995	December 1995
Prototype	July 1995	October 1995
Write/Test individual programs	November 1995	September 1996
Training	July 1995	September 1996
Test full system	October 1996	December 1996
Implement	January 1997	

6. Acquisitions (if applicable)

Remaining acquisitions will be covered under the procurement plans for the Economic Directorate.

Plan Title:	Economic and Agriculture Census and Surveys Support System
Plan Number:	CB-EF-94-01-E
Plan ID:	IT

PART II - ANNUAL PLAN FOR MOBILE HOMES SURVEY (MHS)

1. Program Description

A. Purpose

This program provides monthly, quarterly, and annual statistics for the Nation and the four regions on new mobile home placements, average sales price, and dealers' inventories. It provides monthly and annual statistics on manufacturers' shipments.

B. Benefits

The Department of Housing and Urban Development (HUD) Office of Economic Affairs uses these data to monitor total new housing production and its affordability. The HUD Office of Manufactured Housing and Construction Standards and the Office of Title I Insurance use the data to monitor and evaluate their programs as they relate to the volume, titling, placement location, quality, and prices of mobile homes. Also, a variety of private trade associations and businesses use the data for housing market analyses.

2. Architecture Status

MHS data continue to be processed on the UNISYS. A system has been developed for processing on the DEC.

3. IT Objectives

Our objective is to do overlap testing for three months and then put the system into production by the end of FY 1996.

4. Status

A. Accomplishments/Progress

A system has been developed for the DEC and is being tested. Parallel testing (with current system) is scheduled for the 3rd quarter of FY 1996.

B. Current Plans

We plan to setup the new system to run on the DEC, test the system, and then put it into production.

5. Implementation Schedule

PROJECT: Mobile Homes Survey		
Milestone	Start	Complete
Set up system to run on DEC	August 1995	September 1995
Test system	October 1995	July 1996
Implement new system	January 1996	August 1996

6. Acquisitions (if applicable)

Not applicable.

Plan Title:	Economic and Agriculture Census and Surveys Support System
Plan Number:	CB-EF-94-01-E
Plan ID:	IT

PART II - ANNUAL PLAN FOR THE COMMODITY FLOW SURVEY (CFS)

1. Program Description

A. Purpose

This program provides data on the movement of goods by mode of transportation. The CFS is an essential component in meeting the Census Bureau's responsibility for developing timely and accurate measures of the changing economic and transportation activity in the United States. The CFS produces key transportation statistics at the national, state, and National Transportation Analysis Region (NTAR) levels, which are combinations of BEA Economic Areas.

The CFS, conducted with the support of the Department of Transportation, is an important part of the Census of Transportation.

B. Benefits

The CFS data are in great demand by transportation analysts and decision makers at the Federal, state, and local levels, as they work towards improving the transportation infrastructure. The 1993 CFS results are the first data of this type published by the Census Bureau since the 1977 Commodity Transportation Survey.

2. Architecture Status

The 1993 CFS was processed primarily on the Digital minicomputer (DEC). For the 1997 CFS our goal is to move to a more suitable platform such as SGI workstation, a PC local area network, or similar environment. SAS software will be the primary programming tool.

3. IT Objectives

We began formal design planning for the 1997 CFS in November 1995. Programming would begin in early 1996. Our top goals are choosing the new architecture (moving off DEC) and developing an efficient, systematic approach to processing the 1997 CFS.

4. Status

A. Accomplishments/Progress

The 1993 CFS programming and production on the DEC started in 1992 and will continue through 1996. While the CFS is part of the Economic Census, due to a lack of resources in ESMPD, DMD has provided all programming support to date for the 1993 CFS. Currently, due to lack of resources in ESMPD and DMD, the SAS Branch (SSD) and contract programmers from OAO Corporation are providing support.

We began formal design planning for the 1997 CFS in November 1995. Contract programming from OAO Corporation began in December 1995.

B. Current Planning

We plan to use the SGI machine for completing certain 1993 tabulations for publication at the national level. DMD continues to provide support for the state and NTAR level tabulations on the DEC.

For the 1997 CFS we will:

- Utilize contract programming for all programming tasks.
- Work with the IT area to resolve issues related to DPD access to the SGI machine.
- Evaluate the effectiveness of the contract with OAO.

5. Implementation Schedule

Project: 1993 Commodity Flow Survey		
Milestone	Start	Complete
Finalize Tabulation File	Nov. 1995	
Run NTAR/State Publication Tables	Aug. 1995	Aug. 1996
Run Final U.S. Publication Tables	June 1996	Oct. 1996
Special Tabulations	Feb. 1996	Nov. 1996

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Project: 1997 Commodity Flow Survey		
Milestone	Start	Complete
Develop Functional Requirements	Aug. 1995	Done
Design Systems	Dec. 1995	Oct. 1996
System Procurement/Assignment	Dec. 1995	Done
Specification Development and Programming	Dec. 1995	Dec. 1997
Mailout to Respondents	Dec. 1996	Feb. 1998
Edit/Process Data	Feb. 1997	Nov. 1998
Tab/Publication	Nov. 1998	Dec. 1999

6. Acquisitions

No acquisitions planned.

Plan Title:	Economic and Agriculture Census and Surveys Support System
Plan Number:	CB-EF-94-01-E
Plan ID:	IT

PART II - ANNUAL PLAN FOR THE VEHICLE INVENTORY AND USE SURVEY (VIUS)

1. Program Description

A. Purpose

This program provides quinquennial statistics for the Nation and the states on the physical and operational characteristics of the Nation's truck population. For 1997, we will also provide statistics for the Nation on characteristics of automobiles and buses.

B. Benefits

This information is of considerable value to Federal, state, and local transportation agencies in planning highway cost allocations, road improvements, truck size and weight issues, user fees of commercial and private vehicles, energy consumption, and other aspects of improving transportation services for shippers and carriers. The Federal Government also uses these data as an important framework for the national investment and personal consumption expenditures component of the Gross Domestic Product (GDP), input-output tables, economic development evaluation, maintenance of vital statistics for prediction of future economic and transportation trends, logistics requirements, and regulatory impact analysis.

2. Architecture Status

VIUS data were processed on the DEC for 1992. We expect to use the same general system for 1997, only making modifications that are necessary due to changes in the data collected.

The 1992 data keying was done using the Tartan system. We will convert the keying system to Key Entry III for 1997.

The sample selection process was performed by a private contractor and the state sample files delivered to census. The initial processing of these files was performed on the Unisys System. This operation will have to be converted to the DEC. We will need the capability to read tape cartridges and CD-ROMs to process state files and files from Polk & Co.

We will move the questionnaire imprinting to the 16 line printer for 1997.

3. IT Objectives

Our objective is to keep modifications for 1997 to a minimum. We will only make program and processing changes necessitated by changes in the data items collected, including the expansion to cover automobiles and buses.

4. Status

Mailout for the VIUS will begin in January 1998.

5. Implementation Schedule

PROJECT: Vehicle Inventory and Use Survey Modifications for 1997		
Milestone	Start	Complete
Convert Polk Tape processing to DEC	February 1997	April 1997
Convert to the 16 line printer:		
Programming	September 1997	December 1997
Production	January 1998	July 1998
Move keying to Key Entry III System		
Programming	September 1997	December 1997
Production	January 1998	September 1998

6. Acquisitions

None anticipated.

Plan Title:	Economic and Agriculture Census and Surveys Support System
Plan Number:	CB-EF-94-01-E
Plan ID:	IT

PART II - ANNUAL PLAN FOR MONTHLY RETAIL TRADE SURVEY

1. Program Description

A. Purpose

This program provides monthly statistics at the national level on sales, end-of-month inventories, methods of inventory valuation, and stock/sales ratios. It also produces area level estimates for sales.

The data on sales and inventories are used to produce a component of the Manufacturing and Trade Inventories and Sales, an economic indicator release.

B. Benefits

The data are widely used by policymakers, economists, and others to analyze national economic conditions. Sales and inventory data are used as input in the calculation of the Gross Domestic Product (GDP).

2. Architecture Status

The Monthly Retail Trade Survey uses a DEC-based relational database as a source for: check-in, SSEL/Directory Unit transfers, data entry, telephone follow-up, and limited interactive analysis as part of Services Division's Retail Integrated Surveys Processing Network (RISPN).

We conduct in batch mode on UNISYS the questionnaire preparation, data edits, tabulation, estimation, time series processing, and publication tables. Analytical review is performed through a combination of printouts produced on UNISYS and interactively using RISPN and Datatrieve on the DEC minicomputer.

3. IT Objectives

We are planning a direct migration of the mail, edit, tabulation, estimation, and publication table preparation programs from UNISYS to DEC. For time series processing, we plan to migrate to a SAS-based system on UNIX workstations.

We are also exploring alternative electronic reporting methods, principally Electronic Data Interchange (EDI) for large and medium sized multi-establishment companies.

4. Status

A. Accomplishments/Progress

- . Retail Integrated Surveys Processing Network (RISPN) - We implemented a Digital-based relational database for the check in, data entry, automated call scheduling, update, and limited interactive analysis modules.
- . Migration from UNISYS mainframes to the Digital environment - In FY 1995 we completed the migration of publication programs and began testing individual edit, tabulation, and estimation programs. In FY 1996 we converted the mail programs, but these still must be tested. Most of the other programs (other than ones relying on a new BSR) will be migrated by December 1996.
- . Electronic Data Reporting - In FY 1995 we developed an EDI Implementation Guide for both department and nondepartment store reporters. We targeted large multiunit companies to convert to electronic reporting.

B. Current Plans

Now that RISPN is implemented, we are focusing our resources to migrate from UNISYS mainframe to the Digital environment. Our scheduled completion date for all migration is December 1997.

5. Implementation Schedule

Project: Monthly Retail Trade		
Milestone	Start	Complete
Migration from UNISYS (except BSR-related programs)		Jun 1997
Time Series on UNIX	Jan 1997	Dec 1997
Electronic Reporting		Ongoing

6. Acquisitions

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Acquisitions (if applicable) will be covered under the procurement plans for the Economic Directorate.

Plan Title:	Economic and Agriculture Census and Surveys Support System
Plan Number:	CB-EF-94-01-E
Plan ID:	IT

PART II - ANNUAL PLAN FOR MONTHLY ADVANCE RETAIL TRADE SURVEY (MARTS)

1. Program Description

A. Purpose

This is a principal economic indicator program that provides the earliest indication of current monthly trade activity at the national level. Statistics are provided on sales and sales trends. Data are released approximately 9 working days after the end of the month.

B. Benefits

The data are widely used by policymakers, economists, and others to analyze national economic conditions. Data are used as input to the calculation of the Gross Domestic Product (GDP).

2. Architecture Status

The MARTS is processed around a series of PC-based modules as part of Services Division's MARTS Integrated Surveys Processing Network (ISPN). The ISPN consists of modules for mail preparation, pre-mail processing, interactive keying of mail and fax response, computer-assisted telephone follow-up (for mail edit failures and delinquents), tabulation, analysis, and publication preparation. Final estimates are processed on the UNISYS.

Data are collected in the Data Preparation Division (DPD) on a PC-LAN and transmitted via the Census Bureau's backbone to a LAN at Headquarters for estimation, analysis, and publication.

3. IT Objectives

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We have three main objectives. The first objective is to move off UNISYS for processing our final estimates.

Our second objective is to convert our desktop publishing MACROS to WordPerfect 6.1 and Harvard Graphics 3.0. This will allow us to take advantage of improved capabilities in a Windows environment. The third objective is to expand our electronic data dissemination.

4. Status

A. Accomplishments/Progress

Internet - We put the monthly publication on the Internet via the Economic Directorate's home page to facilitate access and provide timely data to our data users, a strategic planning goal.

We are also providing our data through electronic mail to our various customers, such as Commerce and BEA.

B. Current Plans

A team is currently developing a prototype time series program using SAS on UNIX workstations. We plan to migrate to this SAS-based system.

For the conversion of our desktop publishing, we have formed a team of subject matter and computer automation staff. They will convert the desktop MACROS for the Advance Monthly, MTIS and the Monthly Wholesale publications by December 1996. The conversion will provide standardization across all three publications and will take advantage of improved capabilities of the software, such as easier transfer to the Internet.

We are currently reducing the number of paper copies of our publications and computer listings. We are persuading our data users to obtain the information via electronic means. This will result in savings of time and money.

5. Implementation Schedule

Project: Monthly Advance Retail Trade Survey (MARTS)		
Milestone	Start	Complete
Move from UNISYS	In progress	June 1997
Convert desktop publishing	In progress	December 1996
Electronic Data Dissemination	In progress	Ongoing

6. Acquisitions (if applicable)

Acquisitions will be covered under the procurement plans for the Economic Directorate.

Plan Title:	Economic and Agriculture Census and Surveys Support System
Plan Number:	CB-EF-94-01-E
Plan ID:	IT

PART II - ANNUAL PLAN FOR MONTHLY WHOLESALE TRADE SURVEY

1. Program Description

A. Purpose

This program provides monthly statistics for merchant wholesalers at the national level on sales, end-of-month inventories, and stock/sales ratios. The Monthly Wholesale Trade Sales and Inventory Report is a designated economic indicator and is the only source of monthly wholesale sales and inventory estimates in the United States.

The data on sales and inventories are used to produce a component of the Manufacturing and Trade Inventories and Sales, another economic indicator release.

B. Benefits

The monthly wholesale data are used as input in the calculation of the Gross Domestic Product (GDP). The estimates are also used by policymakers, economists, and others to analyze national economic conditions.

2 Architecture Status

The Monthly Wholesale Trade Survey, as part of Services Division's Digital-based Integrated Surveys Processing Network (ISPN), uses a relational database as a source for: questionnaire preparation, interactive keying of mail and fax receipts and telephone follow-up by DPD interviewers, and several interactive modules used by survey analysts to retrieve records and correct the database. Batch routines for data edits, tabulations, and estimation reside on DEC. Time series-related modules including publication preparation reside on the UNISYS. Analytical review is performed using printouts from DEC, UNISYS and interactively using Datatrieve routines on DEC.

3. IT Objectives

By the end of the 2nd Quarter FY 1996, we plan to migrate the time series-related modules from UNISYS to an alternative platform. We are migrating because the UNISYS will be phased out.

We also plan to convert our current DOS-based desktop publishing operations to a Windows-based environment. This is necessary as our LAN moves toward Windows. We plan to complete this by the middle of 1996.

4. Status

A. Accomplishments/Progress

- . DEC Migration - During FY 1995 we converted our UNISYS tabulation and estimation programs to a DEC environment. Time series-related modules are the only monthly wholesale production activity remaining on UNISYS.
- . Internet - We developed a home page for our estimates to facilitate access and provide timely data to our data users, a strategic planning goal.

B. Current Plans

Work will continue on developing an alternative to UNISYS time series. We are exploring the feasibility of using a DEC-based system versus a SAS-based system. There are benefits to both alternatives. A DEC-based system completes our goal of consolidating survey operations on a common platform. The SAS-based system, however, will provide easier data access, interactive menus, and increased flexibility.

Converting our desktop publishing operations to a Windows-based environment will incorporate enhanced features of both WordPerfect 6.1 and Harvard Graphics 3.0.

The use of exploratory data analysis techniques will improve outlier detection and increase the analysts understanding of trends in the data.

Electronic data reporting is mutually beneficial for respondents and the Census Bureau. This not only provides respondents alternative means of reporting, but also improves the timeliness and quality of data and reduces costs.

5. Implementation Schedule

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Project: Monthly Wholesale Trade Survey		
Milestone	Start	Complete
Move from UNISYS	In progress	March 96
Convert Desktop Publishing	In progress	June 96
Exploratory Data Analysis	In progress	Ongoing
Electronic Data Reporting	In progress	Ongoing

6. Acquisitions

Acquisitions (if applicable) will be covered under the procurement plans for the Economic Directorate.

Plan Title:	Economic and Agriculture Census and Surveys Support System
Plan Number:	CB-EF-94-01-E
Plan ID:	IT

PART II - ANNUAL PLAN FOR THE ANNUAL SURVEYS OF RETAIL TRADE, WHOLESALE TRADE, AND THE SERVICE INDUSTRIES

1. Program Description

A. Purpose

These annual sample surveys (Annual Retail Trade Survey (ARTS), Annual Wholesale Trade Survey (ATS), Service Annual Survey (SAS), Transportation Annual Survey (TAS), and Annual Survey of Communication Series (ASCS)) provide nationwide estimates of retail and wholesale sales, purchases and year end inventories; and receipts, expenses, and other operating statistics for selected services industries.

B. Benefits

These statistics are essential to the Bureau of Economic Analysis' development of the national income and product accounts and input-output tables. The Bureau of Labor Statistics use these data for productivity and price measurements, and the Federal Reserve Board for flow of funds estimates. Other Federal Government agencies, such as the Department of Transportation, use selected statistics for policy development, and program management and evaluation. The data also have private sector applications, including business planning and marketing analysis.

2. Architecture Status

The 1995 surveys are being processed on the DEC. We expect to use the same system for the 1996 surveys (FY 1997) making only the modifications required to introduce new samples of business firms. Effective with the 1995 surveys, we converted data keying from the Tartan system to Key Entry III. With this conversion, the Service Annual Survey was selected as a prototype for Key Entry III secondary applications.

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The timebase processing for the 1995 surveys will be run on the UNISYS. We plan to migrate to DEC timebase or SASBASE on UNIX workstations.

The Annual Survey of Communications Services is one of three economic area surveys that will be used to test the Standard Economic Processing System (StEPS) prototype. This prototype system will be operational by December 1996. We will conduct parallel testing using the 1996 survey that will be mailed in April 1997. StEPS will utilize POSIX compliant workstations that analysts will access from their PCS.

In addition to our existing annual surveys, we plan to expand our survey coverage to include additional transportation industries; as well as finance, insurance, and real estate. These new surveys will be processed under StEPS. We will begin planning and development early next year and continue through calendar year 1997. We will introduce the new surveys in FY 1998 covering the 1997 survey year.

We also have had discussions with representatives of the Health Care Finance Administration on the possibility of conducting, on a cost reimbursable basis, a state-level survey of health care providers. We would begin planning and development upon receipt of funding which could occur in FY 1997. We, however, would not introduce the new survey prior to FY 1998.

3. IT Objectives

Our objective is to improve (or at least maintain) data analysis functionality and minimize programming and processing changes to our existing system while migrating our surveys to StEPS by December 1999.

4. Status

The 1995 ARTS, ATS, and SAS are currently in the field. We will mail the 1995 TAS in March and the 1995 ASCS in April 1996. We will continue processing throughout the year with publications of the SAS, TAS, and ASCS planned for January 1997. The ARTS and ATS data will be published with revised monthly estimates in March 1997. We will begin planning and development for the new FIRE survey, and expansion of TAS, in January 1997, and continue during the remainder of the year.

5. Implementation Schedule

Project: Annual Surveys of Retail Trade, Wholesale Trade, and the Services Industries for 1997		
Milestone	Start	Complete
Data collection and entry	January 1997	June 1997

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Project: Annual Surveys of Retail Trade, Wholesale Trade, and the Services Industries for 1997		
Computer edit and correction	April 1997	November 1997
Imputation, tabulation, and estimation	May 1997	December 1997
Publication	January 1998	March 1998
Program expansion	January 1997	December 1998
Migration of timebase processing to either DEC timebase or SASBASE (UNIX)	August 1996	December 1997
Migration of existing surveys to StEPS	April 1997	December 1999

6. Acquisitions

None anticipated beyond that included under StEPS.

Plan Title:	Economic and Agriculture Census and Surveys Support System
Plan Number:	CB-EF-94-01-E
Plan ID:	IT

PART II - ANNUAL PLAN FOR THE BUSINESS SURVEYS BIRTH SAMPLING AND MAINTENANCE

1. Program Description

A. Purpose

In addition to the quinquennial sample revisions (refer to subconcept Business Sample Revisions), we update our samples to reflect business births and deaths. These updates are based on administrative records and information collected from a mail and telephone canvass of business "births." We also maintain a universe file of every Employer Identification Number (EIN) subjected to business survey sampling and use this file to perform quarterly completeness coverage checks for our retail, wholesale, and service samples.

B. Benefits

The quarterly birth processing operations are essential for keeping our monthly and annual samples representative of their respective universes. Without these regular operations, we would experience serious deficiencies in the quality of our statistical estimates for all our current surveys.

2. Architecture Status

The business surveys birth sampling and maintenance operations consist of four systems (which at this time are primarily UNISYS-based).

- (1) The quarterly birth processing system is comprised of: first stage sampling of EINs not previously represented in the business samples, questionnaire preparation for the selected first stage "births," and second stage sampling using administrative records and information from the completed questionnaire. (We use the DEC-based Automated Control System (ACS) to interactively check-in completed questionnaires

and for reference during DPD delinquent telephone follow-up and DPD's TARTAN system to key mail response.)

- (2) The birth backlog processing is a special case of the quarterly birth processing system and occurs every 5 years as part of the BSR sample revision. Prior to the initial mailing and tabulation of the new samples, this process identifies EINs not subjected to final business survey sampling since the initial extraction of the sampling universe.
- (3) The EIN universe system is comprised of programs which create and maintain a record of all EINs subjected to business survey sampling. This file now contains over 5 million records and grows by about 170,000 records each quarter over the 5-6 year BSR sample life span. Because of its size, to conserve file storage, character information is stored in bits rather than characters.
- (4) The reactivation/delete/universe-register reconciliation system consists of programs to identify EINs which have been reactivated or classified as inactive by the Internal Revenue Service and, as a completeness coverage check, to identify discrepancies between the EIN universe and survey registers.

3. IT Objectives

We plan to complete migration from UNISYS to DEC for all Business Survey birth sampling and maintenance activities by the end of 1996.

4. Status

A. Accomplishments/Progress

Production on DEC--will be done in FY 1996 with the introduction of BSR-97. Some birth backlog operations for the old survey (in fall of 96) will still be on UNISYS.

B. Current Plans

Production on DEC for the first and second stage sampling programs will be done in FY 1996.

The EIN Universe Operations and Reconciliation operatives will stay on the UNISYS until the fall of 1996 for the old BSR-92 sample. For the new BSR-97 sample, these two systems will be redesigned and rewritten for the DEC. This will be done in FY 1996 and in early FY 1997.

5. Implementation Schedule

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Project: Business Survey Birth Sampling and Maintenance		
Milestone	Start	Complete
First and second stage sampling programs	In progress	September 96
EIN Universe	March 96	October 96
EIN Reconciliation	March 96	November 96

6. Acquisitions

Acquisitions (if applicable) will be covered under the procurement plans for the Economic Directorate.

Plan Title:	Economic and Agriculture Census and Surveys Support System
Plan Number:	CB-EF-94-01-E
Plan ID:	IT

PART II - ANNUAL PLAN FOR THE BUSINESS SAMPLE REVISIONS (BSR)

1. Program Description

A. Purpose

At 5-year intervals - once final results are available from the economic censuses - we select new samples of retail and wholesale trade and service industries. Work has started on the next sample revision -- BSR-97 -- which reflects results from the 1992 economic censuses and the 1993 and 1994 Company Organization Surveys. The new samples will be introduced in FY 1997 for the Monthly Retail Trade Survey, the Monthly Wholesale Trade Survey, and for all the annual business surveys.

Between sample revisions we conduct annual sample updates designed to keep the samples current with the SSEL as updated to reflect the latest Company Organization Survey results. The next update will start in the first quarter FY 1996.

Twice every 5 years we select a new sample for the Monthly Advance Retail Trade Survey (MARTS). The MARTS sample is selected from the "full" monthly retail sales sample. We will select and introduce the next MARTS sample in FY 1996.

B. Benefits

These sample revisions are designed to maintain acceptable levels of sampling variability, reduce nonsampling error, redistribute reporting burden, and to accommodate the changing needs of data users.

2. Architecture Status

The next sample revision (BSR-97) will be based on the 1994 SSEL and will consist of: 1) parameter studies, universe extraction, certainty determination, noncertainty sampling, batch listings and interactive analysis routines, old and new sample “overlap” mailings and tabulations, and publication on the DEC minicomputer; and 2) register creation and updates and some old-to-new sample comparison tables from the UNISYS.

The annual sample update consists of: 1) a universe extraction from the latest SSEL, certainty determination, and batch listings and interactive routines on the DEC minicomputer; and 2) several retail sales register matching and comparison programs run in batch mode on the UNISYS.

The next MARTS sample revision will consist of: 1) selecting the sample on the DEC minicomputer, and 2) creating and updating the new MARTS-ISPAN database on Services Division’s PC-based LAN.

3. IT Objectives

Most of this project will be done in FY 1997 on the DEC.

4. Status

A. Accomplishments/Progress

The BSR97 sample has been selected.

B. Current Plans

The new sample will be introduced in the 2nd quarter of FY1997.

5. Implementation Schedule

Not Applicable

6. Acquisitions

Not applicable

Plan Title:	Economic and Agriculture Census and Surveys Support System
Plan Number:	CB-EF-94-01-E
Plan ID:	IT

PART II - ANNUAL PLAN FOR QUARTERLY FINANCIAL REPORT (QFR)

1. Program Description

A. Purpose

The QFR Program publishes up-to-date aggregate statistics on the financial results and position of U.S. corporations. Based upon an extensive sample survey of about 9,000 corporations, the QFR presents estimated statements of income and retained earnings, balance sheets, and related financial and operating ratios for all manufacturing corporations and large mining and trade corporations. The statistical data are classified by industry and by asset size. United States Code, Title 13, Section 91, requires the Census Bureau to conduct this survey and responses are mandatory.

B. Benefits

The QFR provides timely, accurate data on business financial conditions for use by Government and private-sector organizations and individuals. The QFR is a principal economic indicator that provides data essential to key Government measures of national economic performance. The program is the Bureau of Economic Analysis' primary source of data for current estimates of corporate profits, taxes, and dividends for the quarterly estimates of Gross Domestic Product (GDP) and national income. The QFR data are a major building block for the Federal Reserve Board's Flow of Funds and their sole source of domestic nonfinancial corporate data. The Department of Agriculture uses the data to analyze and explain behavior of quarterly retail food prices. The Small Business Administration uses QFR data to trace financial performance of small businesses, analyze and prepare reports for use in loan policy, Congressional testimony, and advise the administration on small versus large company performance.

2. Architecture Status

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Since 1988, the QFR Program has processed and analyzed all of its data on a microcomputer-based system. The Program only uses the Unisys to print multiple copies of the QFR master file company listings, in reduced print format on the high speed laser printers.

3. IT Objectives

By the end of 1996 we plan to be completely off the Unisys. We plan to develop a reference database on the microcomputer as an alternative to the printed listings.

4. Status

A. Accomplishment

We developed the Quarterly Financial Report Data Review System, a diskette for windows-based personal computer users. We provide a new release each quarter including revisions to the four preceding quarters, plus historical data back to 1987.

We added the quarterly press releases to the Internet.

B. Current Plans

We will continue working to complete the migration from the Unisys platform to the QFR Program's microcomputer-based system.

We will implement a new forms redesign within the next 2 years and also plan for development of a CSAQ and use of a TDE system.

5. Implementation Schedule

Not applicable.

6. Acquisitions

Unknown at this time.

Plan Title:	Economic and Agriculture Census and Surveys Support System
Plan Number:	CB-EF-94-01-E
Plan ID:	IT

PART II - ANNUAL PLAN FOR ANNUAL CAPITAL EXPENDITURES (ACES)

1. Program Description

A. Purpose

This program provides comprehensive annual statistics covering detailed capital expenditures for new and used structures and equipment for all domestic, private, nonfarm businesses with at least 5 paid employees for all years, and those businesses with less than 5 employees (including the self-employed) for selected years. Basic annual data are supplemented on a 5-year cycle. The 1st, 3rd, and 5th year supplements provide data for businesses with less than 5 employees. The 2nd year supplements provide added detail by type of structure. The 4th year supplements provide added detail by type of equipment. The United States Code, Title 13, authorizes this survey and provides for mandatory response.

B. Benefits

The data provide estimates of nonresidential fixed investment in the national income and product accounts which are used in developing fiscal and monetary policy. These data are widely used by the public and private sectors to measure economic performance, productivity, capacity utilization, and financial condition. The news media use the data for general economic and business coverage.

2. Architecture Status

For the ACES, we check in mail and fax receipts via a DEC-based series of custom programs in Jeffersonville and Washington. Completed forms are keyed in Jeffersonville, by DPD, using Key Entry III software.

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Edits, tabulations, and the publication process are performed in batch and interactive mode on the DEC, via personal computers. Analytical review is performed by reviewing printouts and interactive data correction sessions.

3. IT Objectives

To continue the development of a fully interactive correction and review system for the ACES. This is the third year of survey production, therefore enhancements and modifications to all parts of the survey are continuous.

The interactive DEC environment will provide:

- o More accurate and timely data due to the more efficient data processing methods, including electronic transmission;
- o More accessible data due to the ability to make interactive corrections before tabulating data; and,
- o More timely publication due to the electronic retrieval of data by users.

4. Status

A. Accomplishments/Progress

1. During FY 1996, we completed the processing and publication of the 1994 ACES, including detailed data on types of structures. This involved several modifications to the correction, review and publication interactive computer system for the survey.
2. We expanded our use of SAS as a means of accessing ACES data for calculating special tabulations and data comparisons for various analytical purposes.
3. We successfully completed conversion to the KeyEntryIII data entry software.

B. Current Plans

Work continues on enhancing the efficiency of the interactive correction and review system. In the near term, we plan to offer publications through electronic means, and investigate the use of graphical data analysis as a review tool.

5. Implementation Schedule

IT processing modifications are ongoing.

6. Acquisitions (if applicable)

Acquisitions will be covered under procurement plans for the Economic Directorate.

Plan Title:	Economic and Agriculture Census and Surveys Support System
Plan Number:	CB-EF-94-01-E
Plan ID:	IT

PART II - ANNUAL PLAN FOR INVESTMENT PLANS SURVEY (IPS)

1. Program Description

A. Purpose

This program is as a principal economic indicator which provides semiannual statistics covering capital expenditures for all domestic, private, nonfarm businesses with 5 or more paid employees. The IPS replaced the Plant and Equipment Expenditures survey and improved the quality and comparability of capital investment data. The IPS provides preliminary estimates of prior year business spending for structures and equipment, and early estimates and mid-year revisions of plans for such investment for the current year . The United States Code, Title 13, authorizes this survey and provides for voluntary response.

B. Benefits

The economic indicator of business investment and plans are widely used by the public and private sectors to measure economic performance, productivity, capacity utilization, and financial conditions. And, these data are used to assess near-term economic prospects and help make production and policy decisions. The news media use the data for general economic and business coverage.

2. Architecture Status

For the IPS, we check in mail and fax receipts via a DEC-based series of custom programs in Jeffersonville and Washington. Completed forms are keyed in Jeffersonville, by DPD, using KeyEntry III.

Edits, tabulations, and the publication process are performed in batch and interactive mode on the DEC , via personal computers. Analytical review is performed by reviewing printouts and interactive data correction sessions.

3. IT Objectives

To continue the development of a fully interactive correction and review system for the IPS. This is the second year of survey production, therefore enhancements and modifications to all parts of the survey are continuous.

The interactive DEC environment will provide:

- o More accurate and timely data due to the more efficient data processing methods, including electronic transmission;
- o More accessible data due to the ability to make interactive corrections before tabulating data; and,
- o More timely publication due to the electronic retrieval of data by users.

4. Status

A. Accomplishments/Progress

1. During FY 1996, we completed the processing and publication of the IPS-1 (Released in March 1996). Several modifications and enhancements were necessary to develop the interactive correction, review, and publication system for the survey. In addition, system modifications and enhancements for the new data supplement were made for mailing and initial processing of the 1994 ACES.
2. CATI - We used CATI as a means of survey follow-up and response improvement due to the quick turn-around necessary in order to meet our release schedule.
3. TDE/PFIRS - We used a variation of this technology to send reminder notices to companies that their survey forms are soon due. Through this system, companies were able to request a survey form be electronically faxed to them.
4. TDE - We put into production a TDE system for capturing data from selected companies in the IPS.
5. Internet - We continued using this technology for each data release.
6. High-Speed Barcode readers and laser sorters - The IPS used this technology during FY 1996.

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7. Geographic Cycling and sorting - The IPS used this technology during FY 1996.

B. Current Plans

Due to resource constraints, the second of the sequential surveys (IPS-2) was terminated. If we continue this program, we will investigate graphical data analysis as an additional review tool for analysts in FY 1997.

5. Implementation Schedule

IT processing modifications are ongoing.

6. Acquisitions (if applicable)

Acquisitions will be covered under procurement plans for the Economic Directorate.